

Environmental Control: Priorities, Policies, and the Law

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Foreword

In October 1969, the Sloan Foundation and the Council on Law-Related Studies made grants to the Columbia University Legislative Drafting Research Fund for an interdisciplinary program on Federal environmental policy, proposed by the Committee on Science and Law of the Association of the Bar of the City of New York. The study was to be an independent effort conducted by Dr. George W. Rathjens of the Massachusetts Institute of Technology, and Professors Frank Grad and Albert J. Rosenthal of Columbia University Law School, in consultation with the Committee. This book is the product of that effort; it consists of papers by the three study principals which in their initial version were presented at a Symposium on Federal Environmental Policy, sponsored by the Association in May 1970.

For the Committee on Science and Law, the environmental policy program has been part of its continuing endeavor to contribute to the resolution of new and challenging questions of public policy posed by the interaction of technology on the one side and legal and governmental institutions and procedures on the other. The model for this endeavor has been the pioneering work of Professor Alan F. Westin, Privacy and Freedom, Atheneum, 1967, the product of a four-year study sponsored by the Committee.

The Committee believes that the papers of Professors Grad, Rathjens and Rosenthal will commend themselves as thoughtful approaches to some central issues of Federal environmental policy -- what should be the nation's goals and priorities, how can these be accommodated within the federal-state structure, and how can we assure that the legal system, a system of rules and sanctions, will operate to achieve the goals. I say "approaches" because it should be clear that protecting and restoring the quality of the physical environment presents choices of policy, and indeed of basic values, so pervasive, so difficult and so important that it will take an effort of years to create the new institutional and legal mechanisms required to deal with them in ways which are calculated both to achieve the desired result and be broadly acceptable in a democratic society.

Nevertheless the dramatic increase in public concern about what has been happening to our air, water and land -- a phenomenon of the last two years -- has already brought about significant improvements and will shortly bring more. There is a long way to go

but the nation is making a beginning. The legal profession too is just beginning, but hopefully it can make its contribution; we would like to believe that the papers which follow will come to be regarded as part of that contribution.

William F. Kennedy

February 1971

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Introduction

This work is the product of a project on federal government policy on technology and the environment undertaken by the Legislative Drafting Research Fund of Columbia University. Initially conceived as a short-term "pilot project"--i.e., a study to determine what ought to be studied--the work was begun in the early days of 1969. The proposal for the project had come from the Special Committee on Science and Law of the Association of the Bar of the City of New York, under the Chairmanship of William F. Kennedy, Esq., and was funded by the Sloan Foundation and the Council on Law-Related Studies, headed by Professor David F. Cavers. The Legislative Drafting Research Fund of Columbia University gratefully acknowledges their support and encouragement.

It is, perhaps, a measure of the rapid development of the field that a study such as this had a measure of novelty when it was first undertaken in late 1969, when institutional and legal aspects of environmental regulation had received relatively little attention. Since then, of course, the subject has become one of considerable interest. The rapid development of the field is illustrated even more sharply by the experience of the writers in the course of preparing their individual contributions. Each of the papers had been substantially completed by June of 1970, subject only--as we thought--to formal revision before going into print. The fall of 1970, however, brought so many new developments in federal and state law and in the institutional arrangements for environmental controls--including executive reorganization plans and a new ordering of administrative review of environmental impacts under the Environmental Policy Act of 1969--that substantial portions of the papers had to be rewritten. And even while the work was already in production, passage of the 1970 air pollution control legislation in December 1970, in the closing stages of the 92nd Congress, again brought some new developments that could no longer be fully reflected in these pages. However, it is clear that the main institutions dealing with environmental regulation have now been shaped for some time to come, and that the legal regulation of environmental controls has also achieved a fairly definite direction. Institutional and legal aspects of environmental controls, though hopefully still open to improvement, have nevertheless been

sufficiently well defined to make them a worthwhile object for an analysis of more than temporary significance.

The three papers that comprise this work were conceived as parts of a whole. Within the limits of the study, the question that had to be faced was what subjects to select for research and discussion, in order to provide coverage of a significant nature. In consequence, Professor Rathjens, with his unique background in the physical and political sciences, undertook to relate the setting of goals and priorities to the known--and unknown--risks imposed by particular classes of environmental insults. His paper on "National Environmental Policy" points to the need for greater discrimination in the setting of priorities as between persistent and irreversible insults to the environment and insults that are relatively temporary and non-persistent. As a scientist, he regards the problems of degradable water pollutants and solid wastes, and of non-persistent air pollutants as essentially solved--because the nature of the problems and the damage produced by them is known and we have the knowledge and technical capacity to abate them. Consequently, in his "taxonomy of environmental insults" he would place far greater priority on injuries to the environment that are persistent or that may, more or less irreversibly, alter the earth's geophysical environment. Pushing his analysis into the area of regulatory devices, he concludes that cost-benefit analysis, the favorite contemporary approach to the control of pollutants--difficult to

apply in any case--is appropriate in the area of environmental control only when dealing with non-persistent injuries to the environment, since the cost of persistent or irreversible damages is not measurable in the normal economic sense.

The "taxonomy of environmental insults" has far-reaching implications in the context of setting standards for permissible limits of emission as well--the known irreversibility of the damage, or the mere possibility that the damage may be irreversible, makes standard setting a far more serious business in that situation than in regulating more transitory phenomena.

The paper on "Intergovernmental Aspects of Environmental Controls" analyzes existing institutional arrangements for environmental management. Though recognizing the need for sound distinctions in the setting of priorities and policies based on the nature and impact of environmental insults, the writer emphasizes the necessity for dealing with environmental problems here and now, as we find them. Although the problem of the non-persistent pollutants may have been "solved" from the research scientist's point of view, in that we know what to do about them--the problem is still unsolved in that we have failed to do it--we have not assigned clear institutional responsibility and we have not provided the means to deal with the problem effectively. The Rathjens and Grad papers fully agree on this point--Rathjens, too, articulates the pressing need to deal effectively with the adverse, immediate and protracted health and economic impact of non-persistent pollutants of the waters and the atmosphere.

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The paper on intergovernmental aspects seeks to provide an overview of the institutions and instrumentalities that deal with environmental problems. The essay is based on the implicit premise that all problems of environmental control are inherently intergovernmental--first, because the place of emission and the place of fallout are in different political jurisdictions in all but the most minor instances and, in any case, because it is almost impossible to limit the impact of environmental insults to any one jurisdiction, and secondly, because even within a single political jurisdiction, environmental regulation generally involves more than a single agency or department of government. Exploring present institutional arrangements and their recent development, the article points to institutional gaps that exist between federal, state and local agencies, between agencies charged with developmental functions and those with regulatory ones, and between the functions of rule making and standard setting, on the one hand, and enforcement and implementation, on the other. The clear implication of this analysis is that present institutional arrangements are neither fully suited to meet the immediate regulatory needs, nor the broader, more long-range needs noted in the preceding essay with regard to the formulation of long-range policies and priorities.

The theme of the need for adequate regulatory controls is further carried out in Professor Rosenthal's paper on "Federal Power to Preserve the Environment: Enforcement and Control Techniques." In reviewing available sanctions and remedies, the essay discovers

few constitutional or other restrictions on the use of a wide range of control techniques available to the Federal Government if it chose to apply them. The essay also discloses that up to now the Federal Government has limited itself in environmental regulations to a rather narrow range of enforcement devices. The availability--through appropriate legislation--of a broader range of sanctions and remedies, public as well as private, running the gamut from administrative remedies through civil, equitable and criminal sanctions and a variety of positive incentives, is encouraging. To be effective, however, traditional techniques will have to be carefully tailored to meet the special needs of environmental protection. A far broader, more flexible arsenal of control techniques is likely to be needed in the future, not only to carry out the enforcement functions of existing and new institutions for environmental control, but also to implement the chosen priorities and policies for the future.

In preparing their articles, the authors had much generous assistance. In the early stages of the study they met in Washington with a number of legislators, their staff assistants, and members of agencies having environmental concerns. These meetings were most informative and stimulating. Special thanks for their time and ideas are due to Senator Jackson and his staff assistant, William Van Ness, to Senator Edmund Muskie and his staff assistant, Don Nicoll, and to Congressman John Dingell and his staff assistant, Grant Sibers. Our appreciation is due, too, to Richard Carpenter, of

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the Library of Congress, to Charles C. Johnson, Director of the Environmental Health Services Administration (now incorporated in the EPA) and to his Assistant Administrator, Jerrold M. Michael, as well as to John Middleton, Director, National Air Pollution Control Administration, and to members of his staff. Our appreciation is due, also, to Professor Joseph Sax, of the Michigan Law School, who, while working on a special project for Resources for the Future, Inc., supplied a number of valuable insights on the uses of private litigation in environmental control.

The authors' appreciation is extended, also, to the members of the Special Committee on Science and Law of the Association of the Bar of the City of New York. The Committee acted not only as the sponsor of the study, but its members also served as an advisory committee, reviewing drafts of the papers and providing helpful comments and criticisms during one of the Committee meetings. In May of 1970, the Committee hosted an open meeting of the Association of the Bar at which the authors presented preliminary versions of their papers. Special thanks are due to William F. Kennedy, Esq., Chairman of the Committee, who not only provided continuing liaison between the Committee and the authors, but also provided encouragement, counsel, and insights based on sound experience. Special thanks, too, are due to Professor David Cavers of Harvard Law School, who, having aided in funding the project through his Council on Law-Related Studies, took a continuing interest in it, and gave freely of his time and wisdom.

Closer to home, the authors, and particularly the two authors (Grad and Rosenthal) whose base is Columbia Law School, owe a great deal to the considerable efforts of the professional and student staff of the Legislative Drafting Research Fund. Valuable contributions to the work during the research stage were made by James Mendelsohn (J.D. Columbia 1970), Terence Rice (J.D. Columbia 1970), and by Daniel Freeman, Jonathan Lehr and Claude E. Salomon (all Columbia Law School Class of 1971). An especially noteworthy research contribution was made by Michael Candido (J.D. Columbia 1970). Some of the students and former students mentioned also rendered fine assistance in the final stage of checking and production of the work, as did Michael Stolz, Jo-Ann Whitehorn Tisman and Henry Welt, all of the Columbia Law School Class of 1972. During the summer of 1970, in particular, the burden of supportive research was borne by Robert Weiner (Class of 1972) and by Mrs. Enid Sterling (J.D. Syracuse 1949), who served as temporary professional staff assistant. Thanks are due, too, to Mrs. Audrey L. Goldberg (LL.B. Columbia 1959) who, in the last two months of her term as Assistant Director of the Legislative Drafting Research Fund, helped the study get under way.

A special note of thanks should be recorded to Professor Louis Henkin of Columbia Law School, who read the manuscript of Professor Rosenthal's paper, and made a significant contribution with his comments and suggestions.

Last, but by no means least, all of the authors wish to record their appreciation to Mrs. Laurie R. Rockett

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(J.D. Columbia 1970), who made a notable contribution to the study first as a student research assistant, and later as Assistant Director of the Legislative Drafting Research Fund. Mrs. Rockett took charge of the production of the work, and assisted with great effectiveness--and tact--in the final revision of the work, helping to put the pieces together into a book.

Having recorded my gratitude and appreciation, and that of my co-authors, let me add that in spite of the many hands and heads that contributed, the responsibility for the views expressed, and for the contents of the pages that follow, remains entirely that of the individual authors.

New York, January 11, 1971

Frank P. Grad
Director, Legislative
Drafting Research Fund

George W. Rathjens

National Environmental Policy: Goals and Priorities

When one asks the broadest questions, "How serious is the threat to the environment, and what should we do about it" one cannot but be struck by the differences in the degree of concern exhibited by different groups. At the one extreme one finds those who view the recent development of great interest in ecology as a diversion and an indulgence of the affluent who, having grown discouraged with the problems of the ghetto and the poor, now see in environmental concerns something that may be more tractable and less controversial. To the poor and the black, the problems of sulfur dioxide in the air they breathe, possible extinction of the peregrine falcon, and oil on the beaches of Santa Barbara are at most secondary or tertiary concerns. This is also true for much of the business community who recognize

that in order to maintain both a suitable environment and image their practices may have to change, but who hardly see the need or the likelihood of drastic alterations in the whole structure of our society.

At the other extreme there are those who see time running out--people who are concerned that we are about to unleash, or may already have unleashed, forces that will result in irreversible changes probably resulting in the early elimination of many living species and possibly of man himself.

One also finds corresponding variability in opinions about the viability of ecological issues as a matter of major political concern. There are those who see the interest of the last few years as a passing fad. Others see it having a longer life, not because environmental alteration is a real threat, but rather because it is, unlike the problems of the ghetto, politically "safe" and of interest to middle class America. And finally there are those who see the environment as an issue of continuing and increasing concern from which we cannot escape because we will be confronted with more and more serious ecological crises.

With such variations in concern about the seriousness of the threat to the environment and about its viability as an issue, it is quite natural that different groups are looking for entirely different ways of coping with the threat. We have new legislation at both the state and the federal level, but there are advocates of more far reaching measures--some calling for a new federal department; some for a new

concept of the role of the federal government; and at the extreme, others calling for a total restructuring of society including renunciation of our Judeo-Christian value system and acceptance of a no-growth economy.

It seems clear that without some clarification of the seriousness of the threat it will be impossible to approach the development of federal policy in any very rational way. We might muddle through as we have in the past to a large extent. However, there are reasons for being very doubtful about such an approach. Our concern has its basis in the fact that man has at his disposal the possibility of modifying the ecology globally and irreversibly--something that is largely a phenomenon of the last half of this century. We can deal with some of the insults to the environment as we have in the past. Others may require very different approaches.

A Taxonomy of Environmental Insults

In considering the problems of insults to the environment some classification scheme may be useful. A division into four classes is used here:

- (1) degradable water pollutants and solid wastes;
- (2) non-persistent air pollutants;
- (3) persistent toxic pollutants (in air, water or soils); and
- (4) factors which may alter the earth's geophysical environment.

The problems which have been of concern for the longest time--pollution of fresh water and the disposal

of solid wastes--we can largely brush aside in a paper such as this at least insofar as our concerns are technical. This is not to say that such problems are not serious. Reversing what has happened to Lake Erie and preventing the same from happening to Lake Michigan and many other bodies of water is important and will require large expenditures and stringent regulations. But to a very large extent we know what must be done. We know how to measure water quality--for most purposes biochemical oxygen demand (BOD) is useful. (It is a measure of the oxygen that would be needed by bacteria to decompose organic wastes.) We have had great experience in removing organic wastes that have been traditionally troublesome in water supplies, including bacteria that are hazards to health. We have also begun to appreciate the seriousness of eutrophication, and attention is now being given to the development of tertiary treatment techniques for removal of phosphate and nitrogen nutrients.

While the demand for pure fresh water can be expected to rise greatly in the years ahead, the development and implementation of public policy to meet the requirements seems straightforward--at least it seems like a simple problem compared to some of the others with which we will be confronted. Not only do we know what we should do and how to do it, we can also predict the consequences of failure to act. In addition, we can draw some small comfort from the fact that the effects of failure will generally be somewhat localized and not totally irreversible. If pollution of some of our rivers gets worse, it will not mean the end of the human

species; and in many cases it will be possible at a later date, with sufficient effort, to bring them back.

The problems of solid waste disposal seem equally straightforward.

In the case of the non-persistent air pollutants--sulfur dioxide, oxides of nitrogen, carbon monoxide, ozone, aerosols, etc.--we can also draw comfort in the fact that the effects will be more or less localized and from the point of view of the species, if not from that of individuals, generally reversible. Otherwise, however, the problems seem more difficult than in the case of solid waste and most water pollutants. Part of the difficulty is in the fact that an airshed is less well-defined than a watershed, but probably the main difficulties are others.

First, we have much less choice about the air we breathe than we do about the water we drink or otherwise use. Assuming water is available, the community or in extremis the individual householder can, albeit at some cost, treat water, almost regardless of its quality, to make it potable. No such option is realistically available with respect to air. We simply have less flexibility, the only present real hope for maintaining air quality, with the limited exception of that in buildings and vehicles, being through control of emissions of pollutants.

Second, trade-off problems may be more common and difficult to deal with in the case of air pollution. Nitrogen oxide emissions from automobiles can in principal be reduced by changes in engine design, but at the price of increasing other undesirable emissions.

Finally, the gaps in our knowledge of the chemistry of air are both greater and more serious than in the case of the non-persistent water pollutants. The complex reactions of various hydrocarbons, sulfur oxides, ozone, and oxides of nitrogen--many of them photochemical reactions--are not yet well understood so we do not know how best to allocate our resources when confronted with mixtures of air pollutants: whether to try to reduce them all or to look for means of reducing one or two in the hope thereby of stopping the chemical reactions that produce some of the more troublesome compounds.

When one thinks about it one will see that noise insults to our environment, although in some respects simpler, have many similarities to the non-persistent atmospheric pollutants. Accordingly, similar approaches to coping with noise may be indicated.

One might consider the persistent contaminants to constitute a third class of pollutants requiring perhaps rather different treatment than those discussed so far. Some, for example, lead and mercury, have been recognized as poisons for hundreds of years, but have assumed new importance because of vastly increased dispersion as a result of modern industrial processes. Others are new: DDT and radioactive isotopes, for example. Because all of these substances are removed from the biosphere only slowly by natural processes--DDT has a half life variously estimated to be months or years compared with three hours for sulfur dioxide--they may be dispersed very widely--worldwide in some cases. Because they are concentrated in successive steps in the food

chain, persistent pollutants can be a serious threat to particular species even when the amounts released and the concentrations in the air or water are low. Particularly in the case of some of the new persistent pollutants, there is a lack of adequate knowledge about the effects of exposure over long periods, and a lack of understanding of the effects of the destruction of one species by these substances on other species.

Finally, in our taxonomy, we identify a fourth class of environmental insults--the things which we are doing which, while not introducing new substances into the biosphere, nevertheless over a period of years may produce major environmental changes. Increasing the carbon dioxide content of the atmosphere as a result of the burning of fossil fuels is perhaps the most discussed example. There are several others: the increase in finely divided particulate matter in the atmosphere; the introduction of water vapor into the stratosphere by rockets and supersonic aircraft; changing of the earth's albedo as a result of changing land use patterns; the possible covering of the oceans with thin films of oil; and the production of large amounts of heat through combustion of fossil fuels and the use of nuclear reactors.

It is not likely that man-produced changes of these kinds have yet resulted in very significant perturbations in the world's climate, but our capacity for producing change is growing so rapidly that the possibilities must be seriously considered. With respect to each of these possibilities we have now reached the point, or can see it fast approaching, when the man-produced

effects may be significant compared to our natural heritage. One could perhaps argue that the neglect of such problems was hardly serious when the amounts of substances such as carbon dioxide being added per decade to the environment as a result of man's activities were but a percent or so of natural abundance, or were small compared with geographical and other natural variations. But we may be approaching the end of that period. The carbon dioxide content of the atmosphere has increased by about 5% since 1940 and will probably increase even more by the end of the century. In the unlikely event that present trends in increasing power consumption continue, within the next two hundred years we will be producing heat at a rate equal to that which the earth receives heat from the sun. While we are not yet able to predict the effects of such changes with any confidence, there is clearly a possibility of very dramatic changes in the environment. Some of these insults might be partially offset by others: increased aerosol concentration may produce an effect opposite to that produced by increased carbon dioxide concentration. However, our knowledge is so limited that we do not know this.

Time periods of concern seem long compared to those we usually think of in discussing other pollution problems--the sulfur dioxide problem, for example--but they are very short indeed on an evolutionary time scale. While wheat rusts can develop fungicide resistant strains on the same time scale that we change fungicides, the time scale for human evolution and that of many other species will be long compared to the time

required for us to change our environment dramatically.

In considering this last class of environmental changes we are confronted with five very difficult problems.

First, there is lack of understanding of the seriousness of the threat. In this respect we are far worse off than in considering other environmental insults. We need both more data and better models of geophysical processes to make very useful estimates.

Second, we are confronted with the prospect of our possibly triggering environmental changes that would be catastrophic on a worldwide scale before we know what we are about, and with the possibility that we will be impotent to reverse what we may have started.

Third, in dealing with these problems it will be necessary to take serious account of what may happen in the rather distant future, something that is almost totally alien to governmental processes. In the United States it is difficult to get the President or other elected or appointed officials to give very serious attention to problems which are not likely to be troublesome during their term of office. The situation is little different in other developed countries. For example, the socialist states have five year plans, not fifty year plans. In societies that think in terms of discount rates of, say, 6 to 20 percent it is hard to generate interest in expending money and effort on programs to cope with a threat that may not materialize for several decades, if then. Only with rare exceptions have societies been willing to undertake programs with

time scales of many decades. The building of cathedrals and other religious endeavors are about the only exceptions. Perhaps there is hope for the environment in the fact that some societies, and some people in our society, regard its preservation with almost a religious kind of commitment. Certainly in coping with our fourth class of environmental insults it will clearly be necessary to do so with the perspective measured at least in decades. We should not leave this point without perhaps noting how much poorer the prospects will be for dealing with the third and fourth kinds of environmental problems when the poorer nations of the world may be responsible for much of the difficulty. For those in a subsistence economy, as is also true of the poor in the developed countries, concern about the future is a luxury that cannot be afforded. Fortunately, the power and the wealth required to cause many of the more dramatic environmental changes (for example such as those that might result from uncontrolled increases in fossil fuel consumption) are to a substantial degree concentrated in the developed world, and within the developed world, among those people who are sufficiently affluent that they can afford to look beyond tomorrow. However there are some frightening exceptions. Countries such as China and India clearly have the capability of producing severe environmental degradation, for example by the very widespread and wholesale use of persistent pesticides or as a result of poor agricultural practices which may lead to severe problems of erosion with large amounts of atmospheric dust resulting.

Fourth, the effects of these fourth kinds of insults will be worldwide (and in this respect the problem of the persistent pesticides, radioactive pollutants, etc., referred to earlier will be similar). The difficulties in achieving international control will be far more difficult than in the case of problems that can be dealt with on a national basis.

Fifth, there is the prospect, with some of the insults of this class, of having to make much more drastic social adjustments than are likely to be required to control other pollutants. At some time we will have to cut back on the rate at which we increase the burning of fossil fuels either because we will exhaust them, or because of the consequences of the addition of carbon dioxide to the atmosphere. Adjustment would be difficult in that case, but mitigated greatly by the possibility of using nuclear fuels. The problem of thermal pollution on a global scale, although probably more distant, will require more radical adjustments. At some time we will have to cut back on the rate at which we increase our use of energy simply because if we do not the earth will become unbearably hot. Such prospects raise a host of questions. When must we begin consciously to impose restrictions on the use of energy? Does that prospect imply a zero-growth economy or something approaching it? Would it be possible, even if the developed world froze its rate of resource use at present levels, for the underdeveloped world ever to consume the earth's resources and contribute to environmental alteration at the same per capita rate we do?

Clearly, the seriousness of the problems raised by this last group of environmental perturbations will depend on population growth. In the view of many, that is the most serious threat of all to the environment. Limiting arguments can be made, as in the case of energy use. If population growth were to continue at present rates there would literally be no room left on earth on which people could stand four or five hundred years from now. Sooner or later then we must accept zero population growth. When? Sooner, rather than later, we will have to make choices about either reducing population growth rates or the rate of increase in per capita consumption of resources.

When one considers the fourth class of environmental insults, including uncontrolled population growth, it is clear that we have only two choices: muddling through with the result probably being far greater human misery and earlier extinction of the species than if we adopt the alternative--an effort to plan and regulate the use of resources and population growth so that our physical environment will be reasonably stable--so that it will not be catastrophically altered on a time scale that is short compared to that required for accommodation to it.

Setting Standards

In general, in attempting to develop policy with respect to pollution, one would expect to try to answer two questions. What level of a given pollutant is permissible; and what are the preferred mechanisms for insuring that that level is not exceeded?

In a few cases the first question can be easily answered by a total prohibition on the introduction of the substance in question into the environment. This is likely to be particularly true of some of the components of our third class, the persistent pollutants. The use of DDT is now prohibited absolutely in some places and lead tetraethyl may be soon. It can perhaps be reasonably argued that alternatives that are available for pest control and for improving gasoline engine performance are sufficiently low in cost to justify foregoing completely the use of these two substances.

More generally, however, the concern will be in setting a non-zero level of contamination that is judged acceptable.

We know that sulfur dioxide in the atmosphere is harmful and unpleasant; and we know that by restricting the use of fuel oil and coal to those having low sulfur content or by using various processes to remove sulfur dioxide during combustion or from exhaust gases, we can reduce sulfur dioxide concentration below levels that would otherwise result. We also have a vague idea that the costs of such practices, which ultimately must be passed on to consumers, are small, or, considering the benefits, at least acceptable. But there is something arbitrary about deciding that oil containing less than, say, one percent sulfur is acceptable while that containing more is not, or for that matter that atmospheric concentrations of 50 parts per billion are acceptable while higher concentrations are not. Why not set the limits at half these values? Fuel costs would be higher, but perhaps the savings in increased longevity, reduced

illness, reduction in corrosion, etc. would justify the higher costs. Where is the crossover point?

A few attempts have been made to estimate the benefits of reducing certain pollutants, for example by trying to establish correlations between property values and air quality. However, these are hardly adequate. Standards seem to be set, based on a combination of expert (but generally grossly inadequate) opinion about the adverse effects of pollutants and a judgment about what the public will pay to maintain certain standards. Can we do better?

The economist would probably argue that cost-benefit analyses can be pushed further. Consider further the case of sulfur dioxide. The economists would look for clever ways of estimating the costs of increased incidence of emphysema and other hazards to health and property which they could in one way or another correlate with sulfur dioxide content in the atmosphere. In theory one would hope to establish a point where there would be a balance between the costs of reducing sulfur dioxide concentrations further and the benefits to be derived from improved health, etc. Both the utility and the limitations can be illustrated with a little more discussion of the sulfur dioxide problem.

Reference has been made to indirect attempts to establish the value of benefits of reducing air pollution by considering correlations between levels of pollution and property values. In principle, the method could be extended by using a number of cases and multivariate analyses to estimate benefits of reducing or eliminating individual pollutants--in the

case under consideration here, sulfur dioxide--or combinations of particular pollutants. Implementation of such an approach is, however, likely to be far more difficult than the theory. But even assuming this could be done, it is likely to result in the imputation of values to the elimination of sulfur dioxide or reductions in concentration that would be capricious in the sense that the value would have been based on misinformation or on lack of information about the adverse effects of sulfur dioxide. If information were available regarding the true extent of the adverse health effect and if this were to be made available broadly enough so that property values were to reflect it, then one could perhaps feel comfortable about using the technique. At present little information is available and what there is is not widely known. This suggests the utility of research to determine the adverse effects, and educational activities so that informed decisions are possible. (The experience of the last few years with cigarettes suggests that this is not a hopeless approach.

If the necessary research were done on the correlation between adverse effects and sulfur dioxide concentration, one might attack the problem of estimating the benefits of reducing sulfur dioxide more directly. However, when one tries this one runs into a set of problems common to nearly all efforts to apply cost-benefit techniques to public health issues. It is relatively easy to place a value on the cost of treatment of disease and on earnings lost due to illness, but far harder to place values on discomfort and anxiety that go with illness, and, if one tries to

consider more than loss of earnings, on loss of life. U37 LI

In both of the approaches suggested, there is the remaining fact that efforts to estimate benefits of reducing sulfur dioxide concentrations, or if one prefers, the cost of tolerating it in the atmosphere--the same thing--one is likely to miss important factors. If, because of imperfect knowledge, we ascribe to sulfur dioxide increases in the frequency of house painting, and increases in several diseases, say emphysema, the common cold, and lung cancer, but fail to include the potentiating or synergistic effects that sulfur dioxide may have in initiating or exacerbating the effects of diseases for which the primary causative agent is some other atmospheric ingredient, then we underestimate the benefits of sulfur dioxide removal or reduction. In some cases this may make the analysis useless, but in others it still may be of value. It will be apparent that cost-benefit analysis can be at least useful in making a fortiori types of analyses. If one can identify one or more adverse effects of pollution and can impute to them costs in excess of those involved in eliminating or reducing the pollutant, one has a sound basis for prohibition or for lowering the permissible levels of pollution. Were it possible to include other unknown or unquantifiable benefits, the case would be made stronger and even further reductions in permissible levels could be justified. (Such a fortiori reasoning presupposes that one can in fact measure the costs of elimination

or reduction of a pollutant without much ambiguity. In many cases this will be possible, but in some the price of reducing or eliminating a given pollutant may involve the introduction of other hazards or pollutants. One way to reduce sulfur dioxide concentration is to use more nuclear power in which case thermal pollution at least, and possibly other problems as well, will be greater.)

Despite the limitations of cost benefit analysis for setting standards, there is certainly room for much work along such lines. However, such approaches are likely to be useful almost exclusively in the case of the pollutants with which we have lived for some time, and which do not produce long-term effects on the physical environment, that is, for substances which comprise our first two classes.

When one turns from the short-lived air and water pollutants to the more persistent ones--those in our third and fourth categories--conventional cost-benefit techniques will be of even less utility in establishing standards. There may be cases where one can identify one or several adverse consequences, the costs of which will be sufficiently great, so that a fortiori arguments of the kind mentioned above will have applicability. Such examples would, however, seem rather exceptional at least considering our present state of knowledge. For many years most of the resources and intellectual effort in trying to cope with insults of our third and fourth categories ought to be focused on simply identifying the physical and biological consequences of pollution rather than on estimating economic costs of those

consequences. We make this statement simply because we know so little about the environmental effects of such insults. The literature abounds with examples of the unexpected, and in some cases catastrophic, consequences of the introduction of new pesticides and other insults to the environment. To mention only a few there are the many cases of the adverse effects of DDT on the reproductive cycle of various species of birds, the cases of concentration of radioactive isotopes in the food chain, and the reduction in the sardine catch in the eastern Mediterranean and the increase in the incidence of bilharziasis in the Nile Delta resulting from the construction of the Aswan Dam.

This suggests that in setting standards for permissible levels of some of these pollutants and for deciding on the approval of projects that can have long-term ecological effects, experimental work, including a careful monitoring of the effects of new insults to the environment, and a considerable degree of modeling of complex physical and biological systems will have great utility.

Perhaps a greater use of adversary type inquiry would also be useful: that is, the use of procedures involving technical experts who have no stake in the introduction of the given substance into the environment, and who, indeed, preferably should be people who are likely to oppose it. What is required is that such people be given access to relevant information, in some cases resources for research, and finally the opportunity to present findings and to confront proponents of programs that might result in environmental alteration.

But despite our efforts, and regardless of the resources available, it is inevitable that our activities will on occasion produce effects on the environment which are unwanted and which we have been unable to foresee. This suggests that perhaps the single most important aspect in setting standards and in arriving at decisions regarding major projects with possible environmental impact must simply be caution.

Mechanisms for Environmental Control

Although economic considerations seem destined to have at most a limited role in helping to set standards for environmental quality, they ought to be at the heart of the development of techniques for insuring that the standards will be met efficiently and equitably.

Indeed, to a very large extent the problem of maintaining a decent environment is the example par excellence of what the economists refer to as the problem of the "common," that is, the problem of maintaining the quality and avoiding the exhaustion of resources which many individuals are permitted to use, but for which none take particular responsibility. One must be concerned in the case of air, water, and indeed of the earth as an ecological system with how the costs should be apportioned so that standards of quality can be met and maintained.

A variety of techniques for discouraging pollution and for defraying the costs of correction are used and have their advocates: outright prohibition on despoliation with varying penalties for violation; public

subsidization of practices which will presumably improve environmental quality, or at least reduce the rate of degradation below what would otherwise obtain; and the imposition of charges or disposal costs on polluters. There are both advantages and serious problems with each of the approaches.

The case of the absolute prohibition is the simplest but even with it there are the problems of identifying violations and of arriving at what are reasonable penalties. Obviously if the penalties are small, pollution may occur on a regular basis with those responsible simply accepting the penalties as a cost of doing business. If this becomes predictable and routine, the fines then become the equivalent of effluent charges.

The use of the latter has been much criticized as implying a license to pollute. There is something in the contention, but much of the criticism would seem to be misguided for the use of such charges can also be a mechanism for achieving efficiency in preservation of the environment. Effluent charges can lead to the efficiencies that go with specialization and economies of scale. In the interest of efficiency it may be much preferable to have a single large treatment plant downstream from several pollutant sources rather than having each source operate its own treatment plant. However, the reverse may also be true, at least in part. If several sources produce effluents requiring radically different treatment, it may be more efficient to accomplish treatment before they are mixed, or before dilution in the large volume of water in a main stream.

Obviously, the economically efficient answer is to set effluent charges high enough to cover the treatment of effluents by a publicly operated facility, leaving it to the producer of the effluents to determine whether he wishes to pay the charges, to avoid them by treating his wastes himself, or some combination of the two. Presumably he will choose the least costly solution.

There are, of course, problems with such approaches to waste disposal. The distance between sources and a publicly operated treatment facility may be large in which case the utility of a significant length of stream may be impaired by pollution. Monitoring of effluents will be required to assess charges--hardly a very severe problem in the case of the liquid wastes from a large industrial concern, but something that would likely be far less practical in the case of the individual household than imposition of flat charges for sewage disposal or incorporation of the charge in property taxes. Third, and most limiting, is the fact that the setting of effluent charges based on the cost of treatment by publicly operated facilities has little role other than in water pollution and in the disposal of solid wastes. Air pollutants, and for that matter other insults to the environment, heat and noise, are not easily recapturable once released. This will also be a problem with those water pollutants not easily removed by conventional sewage treatment.

This is not to say that effluent charges can never have any role in air pollution. The output from industrial stacks could be monitored for effluents, but it would be harder to make a case for any particular

schedule of charges. They could not be based on the cost of "downstream" removal since such removal would be practically impossible. And, without more knowledge than we now have, it would be difficult to use the social costs of the emissions as a basis for effluent charges. However, acceptable levels of, say, sulfur dioxide having been established, charges could be set sufficiently high so that it would be more economical for power plants to burn low sulfur fuel or remove the sulfur dioxide from stack gases. As noted earlier, fines for exceeding certain levels may have the same effect as effluent charges, and in this instance the two would be indistinguishable.

In the establishment of procedures and legislation for environmental control it will generally be desirable in the interest of efficiency to allow those who would pollute as much flexibility as is possible in dealing with their wastes. Giving them the option of paying effluent charges for liquid wastes or, alternatively, self treatment before release is an example, but the principle should also be applied in other cases where feasible. Assume, for example, it is desirable to maintain sulfur dioxide concentration in some area below some specified level (a level which need not necessarily be constant but which could be varied depending on meteorological conditions). One might achieve this by regulating either sulfur content of fuels or sulfur dioxide emissions from stacks. In principle, the latter would be much to be preferred since it would give those who burn fuel not only the option of achieving the objective by burning low sulfur fuel, but also the option

of removal during burning or from stack gases, and it would provide incentives for the development of processes for doing so--including those for recapturing the sulfur in forms that could be marketed to offset all or part of the costs of removal. Such an approach would be applicable only to power plants and others whose production of sulfur dioxide was large enough to justify monitoring exhaust gases and for whom sulfur removal during the burning process was a realistic possibility. For the individual householders these will not be reasonable possibilities, and their contribution of sulfur dioxide (or particulates, etc.) can probably only be limited by controlling fuel composition.

While the foregoing has focused on mechanisms for having the polluter bear the brunt of the costs of coping with his insults to the environment, it is probably inevitable that subsidies play a prominent role in treating environmental problems as they do in other problems of the "common". This is particularly so when one sees the "common" as being the nation as a whole, or, in the case of the fourth, and to some extent the third class of insults we are considering, the world.

If the whole of a river basin or an air shed or a nation is to have its environmental quality improved, one faces the problem of either imposing standards that effect all of those who are potential polluters in the basin, air shed or nation, or alternatively of imposing general taxes in order to cope with the effects of pollution, and to provide subsidies to limit pollution. The latter course, that is, the use of subsidies, is an insidious one from the point of view of public policy

for when the polluter is relieved of the costs of pollution by subsidization, or as a result of a public authority's having taken responsibility for removal of his pollutants, there will be removed many of the incentives for process improvement to avoid pollution. If the federal government provides most of the costs of a municipal sewage plant, there will be diminished incentives for the municipality to impose rigid standards on pollution and a consequent diminution in incentives for industries in the area to treat their own wastes or develop processes that do not produce them. There may even be a positive incentive for pollution-prone industries to locate in the area rather than in others where they might have to bear the full burden of treating their own wastes.

The last point reminds us of the necessity of approaching pollution problems on the scale of the economy as a whole, that is, within any trading area, be it a city, a region, the nation, or the world. Equity and efficiency will generally demand that standards of permitted pollution not be very rigorous in one area while very relaxed in another. It hardly seems reasonable to limit severely the emission of air pollutants in one part of an air shed while imposing no limitations in another city within the same air shed. Industries in the latter will benefit because of the resulting greater tax base, while all within the air shed (if it is properly defined) will suffer from the results of air pollution. Does this imply the necessity of completely uniform standards? If so, over what geographic areas?

For some sources of environmental degradation the standards should perhaps be uniform even on a world scale. This may be particularly true for some of the insults of our fourth class. If increasing carbon dioxide input into the atmosphere appears to be a problem, it may be hard to justify permitting a greater per capita input in, say, the United States than in some other countries. But even in this case the arguments will not be completely clearcut. One might argue that those in colder climates should be allowed to burn more fossil fuel than those in the tropics on the grounds of necessity--an argument implying to some degree that automobiles and air conditioning are luxuries, at least in a relative sense. Or perhaps it would be argued that those nations that are prepared to maintain large forested areas for the removal of carbon dioxide should be allowed to burn more fossil fuel.

For those pollutants of a more immediate concern, it will generally be even easier to make a case for variations in standards. Certainly in the case of short-lived air pollutants such as sulfur dioxide, carbon monoxide, and the oxides of nitrogen there would seem to be little basis for applying the same standards in areas prone to atmospheric inversion such as Los Angeles as to areas such as Denver where inversions are infrequent. It might be argued that the imposition of less stringent standards would put the latter city at an advantage economically. That is true, but it should be regarded as no more unfair and no more unnatural than the fact that Los Angeles has an economic advantage over Denver in terms of access to the ocean. The case then

for differences in air pollution standards in different air sheds seems straight forward. But let us consider a somewhat more difficult problem. Should there be differences in water quality standards in, say, the cases of the Ohio and the Hudson Rivers? If there are lower standards on one, say the former, certain industries will preferentially locate there and the region will benefit perhaps at the expense of New York. But the people of New York will benefit by virtue of having a cleaner river. Perhaps a fair exchange, and certainly seemingly so if the two choices reflect adequately the views of the inhabitants of the two areas. But suppose one regards the rivers as national assets. Why should the Ohio be despoiled for the benefit of the local economy? In a more extreme case, certainly the public as a whole would be outraged if our national parks were destroyed for the benefit of local interests (just as local interests are often outraged, as many Alaskans now are in connection with the deferral of the pipeline construction, when national decisions regarding the environment inhibit local exploitation).

Not surprisingly, no clear rules emerge regarding the question of local option with respect to environment control. It is a bit like education: to a substantial degree the nation feels a responsibility as a whole for the education of its young (and for that matter to a lesser degree for the world). Yet, if a given region wishes to spend less on education and more on something else, within limits, it should probably be permitted to do so.

Are there any generalizations about mechanisms for

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insuring and improving environmental quality? In addition to those regarding the setting of environmental standards, discussed earlier, there are probably at least two or three.

First, to the maximum extent feasible, the costs of removing any pollutants introduced into the environment should be borne directly by those responsible. This implies that subsidies should be avoided. To some extent this is a matter of equity, but to an even greater extent, one of efficiency. All in a given region may suffer equally from the noxious output of a given plant that serves the region, and by taxing all the product can perhaps be removed. That may be equitable if the benefits resulting from the plant's existence are distributed in approximately the same way as the tax base, but it is not efficient in that the pressures for process improvement will be far less effective than if the burden for removal falls directly on the polluter, and what is even more important, the range of options that can be considered for removal will, except where economies of scale dictate otherwise, such as in the case of the individual householders, be greater if the burden of removal is at the source. Unfortunately, it is generally likely to be politically easier for the federal government to use the carrot than the stick. Thus political realism probably requires the use of federal subsidies even though they may be less equitable and less efficient mechanisms for improving environmental quality than the imposition and enforcement of tough national standards.

Second, in general standards should be set so that

those who would pollute have a maximum range of choice with respect to methods of avoidance. This implies that regulations should be imposed at the last feasible point in industrial processes. Unless there is no other feasible alternative, control of inputs should be avoided. And controls on design of plants and on equipment installed in them should be foregone in favor of control of output because if control is limited to the former there will be little incentive to operate and maintain waste removal equipment efficiently.

Third, the revenues obtained from effluent charges, taxes designed to discourage pollution, and fines for violation of pollution standards should generally be used exclusively to deal with the pollutants in question. If they are used for general revenue or other purposes, there is the risk of standards being relaxed to increase revenue, in which case other purposes, however desirable, will be subsidized by toleration of higher levels of pollution than would otherwise obtain.

Comments on Federal Environmental Programs

There are some areas with respect to the environment where the role of the federal government must really be paramount.

With the exception of instrumentation and process equipment development, nearly all of the burden for research and development as well as for monitoring the environment must be borne by the federal government. This is simply because most of what is done will have

national (and indeed international) payoff, and because much of what needs to be done will not be supported by sources other than the federal government. A much expanded program of measurement, research, and development is required, particularly with respect to the third and the fourth class of environmental insults. A good bit that is relevant, particularly to the fourth class, is being done, supported by the Environmental Sciences Services Administration, and, on an international scale, in the Global Atmospheric Research Program and because of the World Weather Watch Program. But those efforts are supported largely in the interest of improvement of weather prediction rather than because of concern about possible longer term changes in climate and other environmental conditions. Much more, particularly oriented to the latter problems, needs doing. Although the problems are international in scale, most of the burden for research must fall on the developed countries, particularly the United States. We consume the world's resources and are responsible for environmental alteration to a degree far out of proportion to our numbers, and we have the capabilities for doing the research. Moreover, as pointed out earlier, it is only the affluent, if they, who are temperamentally conditioned to looking more than a few years ahead.

Although we do not know how soon problems of the fourth class may really be serious, we know that sometime they will be, and there is at least serious cause for concern that that time may be measured in decades or even years rather than centuries. Accordingly, the problems of the fourth class, and also those of the

third class merit high priority. They are not likely to get much attention in the government agencies concerned with more immediate problems. Some of the required expanded effort should be managed directly by the government. We have in mind particularly environmental monitoring for which there is a need on a larger scale than would be appropriate to universities or privately endowed research centers. Much of the other work with respect to longer term problems should probably be done in universities with government support.

Not only should this include investigation and modelling of physical and biological processes, but also a considerable effort in economics and the social sciences. It is none too soon to begin much more intensive studies than are now under way of the effects of crowding on human behavior, and on the problems of economies where growth rate is much reduced, including in the limiting case, studies of the nature of zero-growth societies.

The federal government should probably also take a much more active role than it has so far in setting national standards with respect to our first three classes of pollutants. This is important for two reasons.

In some respects we must regard our environmental heritage as a national one. Within limits, local option has its place, but unrestrained strip mining, pollution of the Great Lakes and major rivers, and the destruction of biological species by persistent pesticides--to give a few examples--must be considered national, if not international problems, rather than local ones.

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Second, we have national markets, and in the interests of efficiency, and to the extent feasible, manufacturers should have to comply with only a minimum number of different sets of standards. This applies notably in the case of automobiles, but might also apply in other areas, for example, more than it does with respect to power plants.

The federal government should perhaps play less of a role than it does in subsidizing pollutant abatement activities. Each such project represents to some extent a violation of the fundamental concept that the charges for removal and treatment of pollutants should be borne as directly as possible by those responsible for their production.

There has been much criticism of the Administration's environmental efforts on the grounds that they were announced as a diversion from other serious problems, and that the levels of expenditure are too low--in short, that the whole effort is cosmetic. There is probably some truth in the charge that the effort is diversionary, cosmetic, and an attempt to capture the initiative from Congressional "environmentalists". However, the charge of inadequate financial support seems less sound. A really vigorous federal commitment need not involve large direct expenditures except for research, development and measurement, but it would involve very tough legislation, including: much more stringent standards on some effluents; more caution in proceeding with programs, both federal and private, that might have adverse but presently not well understood environmental effects; provision for more rapid

enforcement, by the federal government if necessary; and much heavier penalties for violations of pollution standards. Such a program would result in very large economic costs, costs that would be reflected in significant reductions in the rate of increase of the gross national product. Whether the Administration is prepared to move in such a direction remains to be seen. Programs such as the supersonic transport and moves to eliminate the tax-exempt status of organizations devoted to conserving and improving environmental quality are examples that suggest it may not be.

On the other hand, there is basis for some optimism in the passage of the Environmental Policy Act of 1969, particularly in its provisions for the establishment of the Council on Environmental Quality and in the requirement that recommendations for legislation or major federal actions that might significantly affect environmental quality be accompanied by a detailed statement regarding expected effects. If this last provision is taken very seriously, particularly by the Congress as it passes legislation, the Act could prove to be a milestone.

Bibliography

1. CONTROLLING POLLUTION, THE ECONOMICS OF A CLEANER AMERICA (M.I. Goldman ed. 1967).
2. R. RIENOW AND L. TRAIN, MOMENT IN THE SUN (1967).
3. COUNCIL ON ENVIRONMENTAL QUALITY, FIRST ANNUAL REPORT ON ENVIRONMENTAL QUALITY (August, 1970).
4. U.S. DEP'T OF HEW, PUB. HEALTH SERVICE, ENVIRONMENTAL HEALTH SERVICE, NATIONAL AIR POLLUTION CONTROL ADMINISTRATION, AIR QUALITY CRITERIA FOR SULFUR OXIDES (March, 1970).
5. Id., AIR QUALITY CRITERIA FOR PHOTOCHEMICAL OXIDANTS (March, 1970).
6. Id., AIR QUALITY CRITERIA FOR PARTICULATE MATTER (January, 1969).
7. Id., CONTROL TECHNIQUES FOR PARTICULATE AIR POLLUTANTS (January, 1969).
8. Id., CONTROL TECHNIQUES FOR SULFUR OXIDE AIR POLLUTANTS (January, 1969).
9. Id., CONTROL TECHNIQUES FOR CARBON MONOXIDE, NITROGEN OXIDE, AND HYDROCARBON EMISSIONS FROM MOBILE SOURCES (March, 1970).
10. Id., CONTROL TECHNIQUES FOR HYDROCARBON AND ORGANIC SOLVENT EMISSIONS FROM STATIONARY SOURCES (March, 1970).
11. R.L. DUPREY, U.S. DEP'T OF HEW, PUB. HEALTH SERVICE, CONSUMER PROTECTION AND ENVIRONMENTAL HEALTH SERVICE, POLLUTION CONTROL AD., COMPILATION OF AIR POLLUTANT EMISSION FACTORS (N.C. Pub. Health Service Publication No. 999-AP-42 January, 1968).
12. ENVIRONMENTAL STUDY GROUP TO THE ENVIRONMENTAL STUDIES BOARD OF THE NATIONAL ACADEMY OF SCIENCES AND

THE NATIONAL ACADEMY OF ENGINEERING, REPORT ON INSTITUTIONS FOR EFFECTIVE MANAGEMENT OF THE ENVIRONMENT Part I (January, 1970).

13. A.V. KNEESE, RESOURCES FOR THE FUTURE, INC., ECONOMICS AND THE QUALITY OF THE ENVIRONMENT - SOME EMPIRICAL EXPERIENCES (1968).

14. A.V. KNEESE, RESOURCES FOR THE FUTURE, INC., APPROACHES TO REGIONAL WATER QUALITY MANAGEMENT (1967).

15. U.S. COMMITTEE FOR THE GLOBAL ATMOSPHERIC RESEARCH PROGRAM, DIVISION OF PHYSICAL SCIENCES, NATIONAL RESEARCH COUNCIL, PLAN FOR U.S. PARTICIPATION IN THE GLOBAL ATMOSPHERIC RESEARCH PROGRAM (Nat'l Academy of Science, 1969).

16. C.D. Keeling, Is Carbon Dioxide from Fossil Fuel Changing Man's Environment?, 114 PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY, No. 1 (1969).

17. G.J.F. MacDonald, The Modification of Planet Earth by Man, 72 TECHNOLOGY REV., No. 1, October/November 1969.

18. N.H. Brooks, Man, Water and Waste, 70 TECHNOLOGY REV., No. 7, May, 1968.

19. R.E. McKinney, The Environmental Challenge of Solid Wastes, id.

20. T.F. Malone, Finkering with our Atmospheric Environment, id.

21. J.L. Fisher, Limits on the Exploitation of Natural Resources, id.

22. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE, PUBLIC HEALTH SERVICE, OFFICE OF PROGRAM DEVELOPMENT, CONSUMER PROTECTION AND ENVIRONMENTAL HEALTH SERVICE, DIVISION OF PROGRAM EVALUATION AND ANALYSIS, ISSUE STUDY ON AIR POLLUTION (August, 1969).

23. E.D. Goldberg, Chemical Invasion of the Ocean by Man, in YEARBOOK OF SCIENCE AND TECHNOLOGY (1970).

GOALS AND PRIORITIES

24. R.A. Carpenter, Information for Decisions in Environmental Policy, 168 SCIENCE, June 12, 1970.
25. W. Seiler and C. Junge, Carbon Monoxide in the Atmosphere, 75 J. GEOPHYSICAL RESEARCH, No. 21, Apr. 20, 1970.
26. O.J. Fletcher, Controlling the Planet's Climate, XIX IMPACT OF SCIENCE ON SOCIETY, No. 2 (1969).
27. I. Lyon, Nuclear Power and the Public Interest, III THE BENNINGTON REVIEW, No. 3, Fall 1969.
28. J. SNOW, RADIOACTIVE WASTE FROM REACTORS, SCIENTISTS' INSTITUTE FOR PUBLIC INFORMATION (May, 1967).
29. J.M. Pierrard, Environmental Appraisal- Particulate Matter, Oxides of Sulfur, and Sulfuric Acid, 19 JOURNAL OF THE AIR POLLUTION CONTROL ASSOCIATION, No. 9, Sept., 1969.
30. G.M. Woodwell, Effects of Pollution on the Structure and Physiology of Ecosystems, 168 SCIENCE, Apr. 24, 1970.
31. G.D. ROBINSON, LONG-TERM EFFECTS OF AIR POLLUTION - A SURVEY (The Center for the Environment and Man, Inc., CEM 4029-400, June 1970).
32. D.E. ABRAHAMSON, ENVIRONMENTAL COST OF ELECTRIC POWER (Scientists' Institute for Public Information, 1970).
33. T.K. Sherwood, Must We Breathe Sulfur Oxides?, 72 TECHNOLOGY REVIEW, No. 3, January 1970.
34. S. Miner, Air Pollution Aspects of Radioactive Substances (Litton Systems, Inc., Sept., 1969).
35. M. Ways, How To Think About the Environment, LXXXI Fortune, No. 2, Feb. 1970.
36. G. Bylinsky, The Limited War on Water Pollution, id
37. S. Rose, The Economics of Environmental Quality, id

38. T. Alexander, Some Burning Questions About Combustion, id.
39. L. WHITE, MACHINA EX DEO (1968).
40. AIR POLLUTION (A.C. Stern ed. 1968).
41. R.G. RIDKER, ECONOMIC COSTS OF AIR POLLUTION (1967).

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Intergovernmental Aspects of Environmental Controls

The scope of "environmental law" has seen such rapid expansion in the recent past that any attempt to analyze the part played in it by the federal, state and local governments must first face the problem of selection of an area in which intergovernmental considerations have made a significant difference. Although aspects of conservation and resource development are touched at a number of points, the emphasis of this paper is on the control of environmental pollution--including air and water pollution, solid waste, noise and radiation pollution. There are several reasons for this emphasis. Problems of pollution are the most widespread, and many of their aspects are most acute. Moreover, there is a well-developed technology for the control of many pollutants, and all that is required for their successful management is the proper regulatory machinery,

properly staffed and financed. Perhaps more important, environmental pollution is a significant metropolitan and urban problem, and in consequence affects more people than other aspects of environmental management. Because it is largely an urban, metropolitan problem, environmental pollution commonly requires the efforts of more than any one single government for its control. Indeed, environmental pollution has become an inter-governmental problem because its dimensions can no longer be contained within the narrow boundaries of municipal or local jurisdiction.

The most striking aspect of environmental controls is the absence of any broadly inclusive federal policy. To be sure, the passage of the National Environmental Policy Act of 1969¹ indicates an awareness of the need for such a policy and provides broad national policy guidelines for the future. But the Environmental Policy Act was superimposed on an existing scheme--to call it a pattern would be to overstate the case--of federal, state and local involvement in the setting of environmental policies and enforcement efforts that is both inconsistent and bewildering. The National Environmental Policy Act expresses a general policy in favor of the preservation and restoration of the environment without, however, reaching in to adjust existing inter-governmental relations and without seeking to order the variety of regulatory efforts at different levels of government in any systematic way.

The creation in 1970 of the Environmental Protection Agency² represents the first step in sorting out present legal and administrative relationships. Although these actions may be viewed as a promising start in the

development of national environmental policies worthy of that name, the effective formulation of such policy will require a further restructuring of relationships to make them more coherent, more logical and more effective. An examination of the laws that determine the level of government at which policies and standards are set in the control of air pollution, water pollution, solid waste disposal, noise pollution, radiation pollution and other environmental controls will serve as a useful beginning.

The Role of the Federal Government in the Formulation of Environmental Policies and Standards

The historical development of federal involvement in environmental controls has followed a somewhat parallel pattern in almost every aspect of pollution control except in the case of radiation pollution, which the federal government has viewed as a matter of national concern from the very beginning of the development of nuclear energy.³ In all other areas of environmental controls, however, the federal government has moved from a position of self denial of powers to an ever stronger assertion of federal interest. This is understandable because the control of the environment --in the traditional sense--for the health, safety and welfare of the people--be it in the area of water pollution, air pollution or noise--had long been regarded as a proper area for the exercise of the police power by the several states.⁴ The federal government, as a government of limited and delegated powers, had never

regarded itself as a repository of a general police power, even though "the federal police power" has sometimes been mentioned in a somewhat metaphoric sense.⁵ The federal government has involved itself in environmental controls rather gradually. Reliance on the commerce power in the direct control of pollution is the most recent phenomenon of federal regulation; initially it operated indirectly through the federal government's power to tax and spend for the general welfare. Thus, in most fields of pollution control the federal involvement begins not with an assertion of federal regulatory power but through sponsorship of grant-in-aid programs, with federal standards gradually being imposed as a condition of the receipt of federal funds for purposes of environmental control. This traditional Congressional approach to the pollution control problem is exemplified in the policy declaration of the Federal Water Pollution Act of 1948.

It is hereby declared to be a policy of Congress to recognize, preserve, and protect the primary responsibilities and rights of the States in controlling water pollution.⁶

This limitation on the federal jurisdiction was almost entirely self-imposed.⁷ Its justification lay in part in a continued respect for the concept of federalism, and in part in a judgment, probably accurate in 1948, that some form of local control was a more effective means of combating water pollution than federal controls. Consequently, under early water pollution and air pollution control acts the federal function was to operate in full cooperation with state and interstate agencies and with local and municipal

governments.⁸ When pollution problems worsened rapidly, the wisdom of this secondary federal role was questioned.⁹ The result, a new direction of the federal effort, is reflected in the declaration of policy of the Water Quality Control Act of 1965:

The purpose of this act is to enhance the quality and value of our water resources and to establish a national policy for the prevention, control and abatement of water pollution.¹⁰

Though the concept of a partnership with the states still remains,¹¹ the unmistakable trend of federal programs has been to locate the responsibility for final decisions on water quality objectives, standards and priorities in Washington.¹²

AIR POLLUTION CONTROL

A similar development may be noted in the area of air pollution control. In 1955 the Congress enacted the first federal air pollution legislation. The law was entitled "Air Pollution Control--Research and Technical Assistance."¹³ It provided grants-in-aid for state and local air pollution control agencies for research, training and demonstration projects, and gave authority for technical advice and assistance from the federal government. It also authorized the Surgeon General to collect and publish air pollution information. The limited view of the federal role in the 1955 Act is reflected in the Senate Report on the legislation:

The committee recognized that it is primarily the responsibility of state and local governments to prevent air pollution. The bill does not propose any exercise of police power by the federal govern-

ment and no provision in it invades the sovereignty of states, counties or cities. There is no attempt to impose standards of purity.¹⁴

Some eight years later, in the Clean Air Act of 1963, the legislative finding still paid ritual obeisance to the doctrine of primary state responsibility for air pollution control.¹⁵ The Act itself, however, indicated that a major change had taken place in the federal role and in the pattern of federal-state-local relations. It gave the U.S. Public Health Service a far broader role in handling air pollution problems and recognized the need for regional cooperation. While under the 1955 Act grants-in-aid had gone directly from the federal government to the cities, under the 1963 Act the state became the focal point. In addition to grants-in-aid and provisions for research and technical assistance, the Secretary of HEW was authorized to publish non-mandatory air criteria and to encourage and report on efforts to prevent motor vehicle exhaust pollution. Grants-in-aid were also provided for air pollution control programs and, perhaps more significant from the point of view of direct federal regulatory involvement, the law authorized the Secretary of HEW to intervene when air pollution was alleged to endanger "health or welfare," when any state was unable to cope with the problem by itself.¹⁶ The precise nature of these regulatory controls, which have been continued under present federal legislation, will be discussed at greater length in another context.¹⁷ As will presently appear, the 1963 Act, in providing for grants-in-aid to the states for air pollution control, exerted an enormous influence in the development and enactment

of the states' own air pollution control legislation.¹⁸ Moreover, the 1963 Act, departing considerably from the notion of strictly local control of air pollution, gave recognition to the need for regional planning and provided tangible incentives for regional cooperation in its grants-in-aid program--a larger proportion of the costs of establishing, developing and improving air pollution programs was to be reimbursed by the federal government if the grantee agency was an intermunicipal or interstate agency than if it served only a single city or other governmental unit.¹⁹

The 1965 amendments to the Clean Air Act moved even more toward direct federal involvement. They authorized the Secretary of HEW to promulgate and enforce federal emission standards for new motor vehicles, without providing for the participation in the standard setting process by the states or localities.²⁰ This was one of the early instances of clear reliance on the commerce clause as a basis for federal air pollution control. Based on similar constitutional authority, the 1965 amendments enabled the Secretary to act on pollution complaints brought by international agencies or by the Secretary of State. Such action included the ultimate right to bring suit against the polluter.²¹

The Air Quality Act of 1967 brought the federal government squarely into the field of air pollution control. While continuing the provisions of the earlier Clean Air Act for grants-in-aid for research and for other program activities by air pollution control agencies, for the first time the Secretary of HEW was not only authorized but charged with the duty of

issuing air quality criteria.²² The Act specifically required him to designate broad atmospheric areas, and to specify air quality control regions. He was also required to issue information about air pollution control techniques, and to promulgate air quality criteria. Once criteria and control techniques had been issued, the states were then required to set standards and make plans for their implementation; these standards were to be designed to meet the air quality standards for the specific air quality regions or parts of regions within the state's boundaries. If a state failed to adopt standards of its own, the Secretary was authorized to promulgate standards for the state, following a conference with the appropriate state officials. If requested by the state, a hearing was required before such standards could be promulgated. Moreover, if the state failed to enforce its own standards or failed to enforce the standards set for it by the Secretary, he was authorized to request the Attorney General to commence lawsuits for their enforcement whenever interstate air pollution was involved.²³

A further change in the direction of greater federal involvement in environmental controls was evidenced by a new power granted by the 1967 Act. The Secretary of HEW was authorized to request the Attorney General to bring an abatement action in any air pollution situation which presented an imminent and substantial danger to health, without the necessity of a prior conference or hearing.²⁴ Moreover, the Secretary was granted exclusive authority to establish and improve emission

standards for new motor vehicles, except in those instances in which a state had adopted a higher standard for new motor vehicles prior to March 30, 1966.²⁵ In fact, the exception applied only to the State of California, which had adopted such standards.²⁶ The Secretary was authorized, too, to study the feasibility of national emission standards, and was granted the power to require the registration of fuel additives.²⁷ In 1970 the function of the Secretary under the 1963, 1965 and 1967 Acts were transferred to the Administrator of the newly formed Environmental Protection Agency.²⁸ At present, in 1970, legislation is pending in Congress to authorize national emission standards.²⁹

It is perhaps noteworthy that the 1967 Air Quality Standards Act not only placed greater emphasis on federal regulatory controls but also deemphasized local controls to a considerable extent. The initial burden for setting standards and for adopting plans for their implementation to meet regional air quality standards is placed on the states, after an appropriate public hearing. There is, moreover, no requirement that the local governments participate in such hearings.³⁰ The shift from a local to a broader regional, if not national, emphasis was reflected, too, in a number of federal incentives to regional cooperation. To be sure, the encouragement of regional cooperation--and especially the encouragement of interstate compacts--is not exactly unambiguous. While encouraging interstate compacts for air pollution control, the Act expressed the Congressional intention to

disapprove any interstate compact which included states not within a federally determined air quality region.³¹ This limitation, as will presently appear, aborted three air pollution control compacts on the verge of adoption.³² However, though the federal attitude towards interstate and regional cooperation is not as liberal as appears on the surface, the Air Quality Standards Act does provide for more substantial financing of air pollution control programs in interstate regions than in intrastate regions, and seeks to stimulate the establishment of air quality standards in interstate air quality regions by paying up to 100 percent of the costs of planning such interstate programs for the first two years and, thereafter, authorizing the payment of up to three-quarters of the expenses of such a program.³³ There is authority also for the Secretary to establish a federal air planning commission for consultation with the respective governors if the states fail to establish interstate air quality planning regions.³⁴

The federal role in air pollution control with respect to policy making and standard setting is thus one of limited but increasingly direct involvement. For the present, the federal government merely designates air quality regions and issues air quality criteria which, in a sense, are performance standards. It is up to the states to work out emission standards and plans for their enforcement so as to meet the federal air quality criteria, the performance standard nationally established for designated air quality regions. Though the federal involvement in setting emission standards for

automotive pollution is somewhat more direct, this direct involvement in the policing of standards is thus far limited to new cars, the specific area where the federal government has the means of regulation at the source. The imposition of federal standards for emissions generally is as yet in the future. Though the federal government prescribes standards for air quality generally, it is left to the states--and to the localities--to establish the emission standards which industry and others must observe and which the air pollution control personnel must enforce.

WATER POLLUTION CONTROL

The parallel developments in the history of federal regulation of water and air pollution have already been noted. Although modern developments have been very similar--indeed, much of the federal air pollution control legislation is an almost verbatim adaptation of the water pollution legislation--it is nonetheless true that the federal government asserted an interest in certain aspects of water pollution control as early as the late nineteenth century. The first such federal statute was enacted in 1886 and prohibited the dumping of refuse in New York Harbor.³⁵ The Rivers and Harbors Act of 1899 also prohibited the discharge of "waste materials" into any navigable waterway excepting waste which flowed in a liquid state from streets or sewers.³⁶ While the Rivers and Harbors Act has seen recent and fairly frequent application as an anti-pollution measure,³⁷ the obvious intent of early rivers and harbors legislation was

simply to protect navigation against floating obstructions.

Subsequent federal legislation dealt mainly with water pollution as a vector in the spread of communicable disease. The Public Health Services Act of 1912³⁸ authorized the investigation of the effect of pollution in navigable lakes and streams on public health. Subsequent cooperation between the Public Health Service and state agencies resulted in the voluntary adoption of nationwide standards for the treatment of drinking water. The adoption of these standards has almost entirely eliminated waterborne diseases.³⁹

When oil pollution became a problem in the 1920's the Oil Pollution Control Act of 1924⁴⁰ was enacted to combat oil discharges that were causing damage to aquatic life, mainly shellfish, and to recreational facilities and docks and harbors.⁴¹ The Act applied only to coastal waters and was therefore of limited use.

Between 1924 and 1948 several efforts were made to enlist the assistance of the federal government in water pollution control.⁴² Water pollution had increased drastically as a result of the wartime growth of industry and, in 1947, a number of water pollution control bills were introduced in Congress.⁴³ The first federal Water Pollution Control Act, which grew out of these legislative endeavors, was signed into law by President Truman on June 30, 1948.⁴⁴ The policy of this act--as stated in its legislative purpose section--was one of cooperation with state and local authorities already engaged in water pollution control.⁴⁵ Acknowledging the states' primary responsibility for water pollution

control, Congress hoped that, with federal support, local programs would be able to handle pollution problems effectively.⁴⁶ The federal role in enforcement under the 1948 act was very narrow indeed. Under section 2(d) of the Act the Federal Security Administrator was authorized to ask the Attorney General to bring suit on behalf of the United States against a person polluting interstate waters, but only after affording the State in which the pollution originated a reasonable time to take action against the polluter and then only with its permission.⁴⁷ The Act was to expire in five years; in 1952 it was extended through 1956.⁴⁸

Comprehensive and permanent federal water pollution legislation was not enacted until 1956.⁴⁹ The 1956 law, however, reaffirmed the Congressional policy to acknowledge and protect the state's primary responsibility in the area.⁵⁰ On the federal level, the Act broadened and intensified the research and training aspects of the program by authorizing research grants to public and private agencies and to qualified individuals. It also authorized grants to the states and to interstate agencies for water pollution control activities. Moreover, a substantial annual appropriation was authorized for construction grants to states, cities and other government agencies for the building of waste treatment works.⁵¹ Other aspects of the 1956 law were to provide for simpler procedures for federal abatement actions against interstate polluters⁵² and a strengthening of the Pollution Control Advisory Board that had been created under the 1948 Act.⁵³ The Act also established a program to control

pollution emanating from federal installations.⁵⁴

There was no further federal legislation during the next twelve years, until President Kennedy threw the weight of his office behind a more active federal water pollution control effort.⁵⁵ In 1961 the federal Water Pollution Control Act was amended to strengthen certain administrative aspects of the law as well as the grants-in-aid and technical assistance features of the earlier program.⁵⁶ The 1961 amendment also extended the reach of federal abatement authority. Previously the federal government had asserted authority to abate pollution in "interstate waters"; this authority was extended to include all "navigable waters" whether interstate or not.⁵⁷

In spite of these efforts the quality of the nation's water continued to deteriorate, and in April, 1963 the Senate Committee on Public Works appointed a special Subcommittee on Air and Water Pollution.⁵⁸ This subcommittee, under the chairmanship of Senator Muskie, became the leading force in water pollution control efforts. After three sessions of debate, Congress finally passed the Water Quality Act of 1965.⁵⁹ For the first time in any federal pollution statute, the declared purpose of the Act was to establish "a national policy" for the regulation of water pollution, language subsequently adopted in the 1967 Air Quality Standards Act.⁶⁰ Thus the 1965 Water Quality Act marked the earliest assertion of federal leadership in the nation's anti-pollution efforts.

The 1965 Act assigned responsibility for the federal program to a newly created Federal Water Pollution

Control Administration (FWPCA) in HEW. It also expanded the appropriations for construction grants for sewage treatment plants and provided more substantial funds for research into pollution problems. But most important was the enactment of a timetable for the establishment by the states of water quality standards for interstate waters; these standards were to be used by the federal agency in enforcing pollution abatement.⁶¹

Shortly after the effective date of the new law, the President submitted a reorganization plan that proposed a transfer of the federal Water Pollution Control Administration from HEW to the Department of the Interior.⁶² The purpose of this transfer was to consolidate administrative responsibility for all phases of the federal government's water resources program in a single department.⁶³ In 1970 the Administration was again transferred from Interior to the Environmental Protection Agency in a further consolidation of federal environmental programs.⁶⁴

Throughout 1966 there was considerable activity both in Congress and in the executive department with hearings and reports on water pollution following in rapid succession.⁶⁵ The result was the Clean Water Restoration Act of 1966.⁶⁶ This Act further increased construction grant authorizations and authorizations for several existing and newly added research and training programs. It also provided added incentives to the states to adopt water quality standards and to contribute to the support of the construction of water treatment facilities.⁶⁷ In addition, the law extended federal jurisdiction over enforcement to international boundary

waters and transferred responsibility for administration of the Oil Pollution Act to the Secretary of the Interior; the coverage of that act was also extended to include inland waters.⁶⁸

The contribution of the Water Quality Act of 1965, as amended by the Clean Water Restoration Act of 1966, was to provide for the establishment of nationally required standards of rising quality for interstate waters.⁶⁹ The law did not provide, however, for the establishment of a single set of national standards. Instead, Congress provided for an elaborate procedure to ensure that the establishment of standards would be primarily a state responsibility, subject to federal approval.⁷⁰ Under the 1967 Act, each state was given until June 30, 1967 to adopt water quality standards applicable to interstate waters within its borders. If a state failed to meet this deadline, or if the standards submitted to the Department of the Interior were rejected, the department itself was authorized to establish water quality standards for interstate waters within that state.⁷¹ All states, however, met the deadline.⁷²

The several states set standards after the required public hearings at which testimony was heard relating to present and future demands on the waters of the particular river.⁷³ The present and prospective uses and the appropriate water quality having been determined, descriptive and numerical values were then established for different uses and different quality classifications. These water quality criteria were then submitted to the Department of the Interior

accompanied by a plan for achieving and maintaining the standards. The plan included such components as construction schedules for treatment works, enforcement procedures and proposed steps to prevent pollution, as well as recommendations for monitoring water quality.⁷⁴ At present nearly all of the states' proposed standards have been approved and are in effect.⁷⁵ Thus, while there does not exist a general national standard, each stretch of interstate water is regulated by quality standards formulated for the particular river in recognition of the fact that each body of water has its special characteristics and uses.

The federal role has, however, gone somewhat beyond the approval of state-developed standards. Although the 1965 Act itself provided relatively little guidance to the states,⁷⁶ the Federal Water Pollution Control Agency issued guidelines to indicate the regulatory aspects of greatest concern to the federal agency.⁷⁷ The first of these provided that state standards allowing for less than existing water quality would be unacceptable. Criticized by industry,⁷⁸ this "lock in" effect was nonetheless consistent with the statutory policy of "enhancing the quality of water" and has been reaffirmed.⁷⁹ The guidelines also reflected the federal philosophy that has been described as the "clean water" approach--no standard may allow treatable waste to be discharged without the best practicable treatment or control unless there is evidence that a lesser degree of control will still provide sufficiently high water quality.⁸⁰ The guidelines thus rejected an older regulatory philosophy based on the traditional notion

of waste management, namely, to use the rivers so as to maximize the waste dilution and assimilative capacity of the nation's waters.⁸¹

The most recent federal activity in the area of water pollution was the passage of the Water and Environmental Quality Improvement Act of 1970.⁸² A product of Congressional concern with the disastrous spills of recent years,⁸³ the Act concentrated on strengthening federal law on oil pollution. Federal jurisdiction was general--the ambiguous term "coastal waters" was replaced by "contiguous zone" and offshore facilities as well as vessels became subject to federal regulation. The basic provisions authorize the President to prepare a national contingency plan for oil removal.⁸⁵ Others include regulation of other "hazardous" substances⁸⁶ and federal grants for training and demonstration projects. Title II of the Act creates an Office of Environmental Quality in the Executive Office of the President to provide administrative support for the Council on Environmental Quality.⁸⁸ The Act, however, does not effect the basic structure of federal-state relations in the general control of water pollution; its provisions supplement rather than amend the 1967 Act, which remains the basic source of federal power for standard-setting and regulatory activities in the water pollution area.

In a sense, the federal regulatory efforts under the recent water pollution control legislation may be analogized to the federal effort in the air pollution area. In both instances, there is reliance on nationally protected quality standards to be achieved by more

specific state regulations to control emissions and effluents. In both instances there is an attempt to utilize federal regulatory power, relying on state origination of standards in the first instance. The federal attitude of regulatory reticence, however, is likely to be more effective, and indeed has been more effective, in the field of water pollution control than in the field of air pollution control. Since water quality standards for any one interstate river must be approved by the federal Water Pollution Control Agency for every state along the entire river's length, there is likely to be greater regulatory continuity than in the less well-defined context of air quality regions. Nonetheless, just as in the case in the field of air pollution control, the federally approved water quality standards are by their nature performance standards, and it is up to the individual states to deal directly with industrial and other polluters through the enforcement of standards of emission. Just as in the case of air pollution control, pending federal legislation in the water pollution area seeks to extend federal regulatory jurisdiction beyond the area of water quality standards to deal directly with emission and effluents.⁸⁹

SOLID WASTE DISPOSAL

Air pollution and water pollution are by their very nature problems of regional if not national dimension. The ambient air clearly is no respecter of jurisdictional boundaries, and water pollution follows the pattern of river basins which, in turn, follows the

geographic scheme of the great watershed systems which do not happen to fall within the boundaries of any one state or locality. A slightly different problem, one which still is viewed as primarily local in scope, is that presented by accumulations of solid waste. Traditionally, refuse and garbage removal has been a task of local government. Wastes collected locally are generally disposed of by incineration--usually in municipal incinerators or by burial in sanitary landfills, again locally regulated, generally by local health or sanitary codes. Until recent years the solid waste disposal problem has been viewed as a purely local problem. Although there was a good deal of justification for this view,⁹⁰ there is evidence that it may soon be unrealistic.⁹¹ The impact of available disposal systems on a region as a whole has made the disposal of solid waste more than a local problem. If it is incinerated, an air pollution problem almost invariably arises. If it is buried in sanitary landfills, the leaching of chemical components into the underground water table and the resulting pollution of the waterways will eventually affect more than the immediate locality. Moreover, larger metropolitan communities are running out of space for sanitary landfills and, with growing inability to absorb the products of incineration in the atmosphere, the problem of what to do with solid waste has assumed national proportions. The national interest, moreover, is involved not only because of the impact of available methods of disposing of solid waste, but also because the source of the solid waste problem is national and not local in

its nature. The enormous recent increase in the amount of solid waste per person in the nation is attributable to the enormous increase in the technology of packaging and in the manufacture of goods that eventually end up as solid waste. Thus it is nationwide industrial activities, both in the general production of goods and especially in the production and use of a variety of packaging materials and of non-returnable--and non-degradable--containers that have added immeasurably to the problem.

The fact that the origin of the solid waste problem has become national in scope and that the problem itself is rapidly becoming too great for the municipalities to handle themselves, has resulted in fairly consistent involvement by the states, and some five years ago, by the federal government with the passage of the Solid Waste Disposal Act of 1965, enacted as part of the Clean Air Act.⁹² If past patterns hold true, the involvement by the federal government by way of research and demonstration grants under the Act is only the beginning of deeper and more substantial continuing federal involvement.

The stated purpose of the act is

..to initiate and accelerate a national research and development program for new and improved methods of proper and economic solid-waste disposal, including studies directed toward the conservation of natural resources by reducing the amount of waste and unsalvageable materials by recovery and utilization of potential resources in solid wastes..⁹³

Indeed, President Johnson himself had urged the Congress to act on the problem of solid waste disposal and had recommended legislation to assist the states in devel-

oping comprehensive programs for some forms of solid waste disposal and to provide for research and demonstration projects leading to more effective methods for disposing of or salvaging solid wastes.⁹⁴ The 1965 Act contained no regulatory provisions. Reminiscent of early water and air pollution laws, it authorized the Secretary of HEW (now the Administrator of the EPA) to render financial and technical assistance to appropriate public agencies to develop and apply improved methods of solid waste disposal. The Secretary was also authorized to cooperate with public and private agencies in conducting research, to make grants-in-aid to support such research and to make available the results of such research.⁹⁵ Grants-in-aid were also provided to support the construction of solid waste disposal facilities, but no grant-in-aid was to pay for more than two-thirds of the construction costs of any facility. Similar, too, to early air pollution and water pollution legislation, the Secretary was instructed to encourage cooperative activities by state and local governments and the enactment of uniform state and local laws governing solid waste disposal. The Secretary was also authorized to make grants to state and interstate agencies for studies, and to establish eligibility requirements for such grants. The stated object of the research program was to find ways of disposal that created no health hazards, and to find ways to recycle scrap materials into production processes. Again, interstate and regional cooperation was encouraged--the grant program provided for payment of up to two-thirds of the cost of local demonstration

projects and up to three-quarters in the case of regional intergovernmental projects.

A variety of disposal methods have been explored in the demonstration projects for which grants are authorized by the Act.⁹⁶ Most recently, in 1969, the Administration asked Congress for a simple extension of the Act with somewhat greater appropriations but with no basic change in policy.⁹⁷ A number of bills were introduced, however, moving in the direction of stronger federal involvement in the solid waste disposal area. These bills would provide for more federal spending on the construction of local waste disposal facilities, and would fund studies both of economical means of recovering useful material from solid wastes, and of incentives and penalties to help solve the solid waste disposal problem. Proposed legislation would also seek practical changes in current production and packaging practices, so as to reduce the amount of solid waste.⁹⁸ While neither the existing Solid Waste Disposal Act nor the newly proposed solid waste legislation sets any federal standards, it is clear that such standards are likely to be authorized in the foreseeable future if the history of earlier water and air pollution legislation is any guide.

NOISE POLLUTION CONTROL

Noise is another area of environmental pollution in which the federal regulatory interest has thus far been quite limited. "Noise pollution" is a more narrowly local problem than either air or water pollution, or even solid waste. Until fairly recently the effect of

a noise source was limited to the distance the noise would carry. Urban noises generally, and particularly industrial noises, have therefore traditionally been treated as appropriate subjects for regulation by the localities and the states. Industrial noise has commonly been dealt with through labor and safety codes on the state level, while ordinarily city or street noises, such as the common sounding of horns, excessive noises from radio and record shops and other incidental noise sources have been treated by local legislation.⁹⁹ One common source of city noise, namely excessive noise from automobiles, has generally been regulated by state legislation requiring the installation of effective mufflers.¹⁰⁰

The only new aspect of noise pollution, one in which the federal government has recently become involved, is noise created near airports by powerful jet engines and, looking towards the future, the effects of the sonic boom which may result from the development of a supersonic transport. In contrast to the lack of federal law in the area of noise control generally, regulation of airport noise, as will be discovered at a later point, has been pre-empted by the federal government.

It has been said that federal interest in this aspect of noise control became greater when members of a politically informed and capable group, namely upper middle class persons with substantial homes in suburban areas near airports, began making their power felt. From 1965 to early 1970, a total of 50 separate bills concerning noise control were introduced in Congress.

Most of these sought to bring about abatement of aircraft noise through the development and federal certification of quieter airplanes, the introduction of less noisy methods of aviation, and the development of zoning restrictions to limit the use of land surrounding airports. Some of the bills would have authorized funds for research and development in the problem of aircraft noise, and a few dealt specifically with the problem of sonic boom.¹⁰¹ Only three of the 50 expressly dealt with noise as an aspect of environmental pollution generally.¹⁰² Most died in committee and it was not until 1967 that a bill sponsored by the FAA, and a number of others of a similar nature reached the committee hearing stage. These all authorized and required the FAA to set noise limits in the certification of new aircraft. The FAA bill, H.R. 3400 was passed by Congress and was signed into law by the President in 1968.¹⁰³ In 1969 two regulations to control noise in the vicinity of airports were proposed by the FAA under that law. The first of these required that the noise nuisance factor would have to be taken into consideration in preparatory aeronautical studies of proposed airport projects. The second set specific noise level limits in FAA certification of new aircraft. After comments had been solicited and received by interested parties, the first proposed regulation was withdrawn for further study, and the second was promulgated essentially as proposed.¹⁰⁴ In addition to laws and regulations dealing specifically with noise, noise pollution by aircraft may be affected by § 12(f) of the Airport

and Airway Development Act of 1970 which requires the Secretary of Transportation to consult with government agencies concerned with environmental problems in formulation of a national airport system plan.¹⁰⁵

Aside from regulation of aircraft noise, the most significant federal action in the area was the adoption by the Department of Labor in 1969 of a regulation based on the so-called "Walsh-Healey Amendment,"¹⁰⁶ which set decibel limits for industrial noise to protect the health and safety of employees in all industrial concerns with government contracts in excess of \$10,000. The impact of this regulation on industry performance is likely to be major. If the past is any guide to the future, federal decibel limits for industrial noise will in due course be adopted by state labor departments that had not had such limits previously. Moreover, in view of the relatively low amount of government contracts necessary to bring a company within the regulatory scope of the federal regulation, many companies whose work is not primarily government contract will probably be covered by the law. The desirability of such regulation is beyond question since excessive industrial noise has led to substantial hearing difficulties and deafness.¹⁰⁷

Aside from some incipient regulatory efforts with respect to airplane noise and excessive industrial noise the federal government has exerted considerable influence in the development of noise pollution control standards through federally sponsored research rather than legislation. Most of the studies completed since 1965, concerned aircraft noise and sonic boom and were authorized

or sponsored either by NASA or by the FAA.¹⁰⁸ A most influential study on industrial noise and environmental control¹⁰⁹ was sponsored by the Public Health Service in 1967 and, in 1968, HUD published a report on field studies involving the effects of noise in the urban and suburban environments.¹¹⁰

RADIATION CONTROL

In the area of radiation control, the history of federal regulation is considerably different from that of other areas of environmental controls. While in other areas the federal government has entered the field gradually, leaving primary regulatory powers in the states and localities, in many instances emphasizing local controls when local controls were no longer wholly appropriate, the history of radiation control regulation moves in the opposite direction. Here, because of the manner in which atomic energy had been developed during the war years, preemptive federal regulatory controls were asserted in 1946 when the Atomic Energy Act was first passed.¹¹¹ It was not until 1959 that the federal government released its full preemptive sweep of power and permitted states and localities to share part of the rule making and standard setting powers, as well as some of the powers of enforcement.¹¹²

It should be stressed that we are not concerned with the question of reactor placement or the question of reactor safety generally, but simply with the far more limited issue of radiation pollution caused by a properly functioning nuclear installation and by

the disposition of radioactive wastes. Under the Atomic Energy Act of 1946, as well as under its subsequent amendments, the Atomic Energy Commission was made nationally responsible for the setting of radiation protection standards relating to nuclear installations. To the extent that these responsibilities consisted of establishing "generally applicable environmental standards for the protection of the general environment from radioactive material" they have now been transferred to the EPA.¹¹³ Under the 1946 Act the Atomic Energy Commission was given vast and far-reaching powers; one of its major functions was that of advancing the development of nuclear power for peaceful purposes. It has been criticized from time to time--just as have other agencies that combine developmental functions with protective functions--for sometimes advancing its developmental interests at the expense of the protection of the environment.¹¹⁴

Despite the vast range of the Commission's rule-making powers, the power to make rules for radiation protection was not expressly stated in the Atomic Energy Act. However, the power to enact standards of radiation protection was held to be one of the discretionary--though not obligatory--functions of the Commission.¹¹⁵ In fact, in setting radiation protection standards the AEC relied over the years on the advice and guidance of the National Council on Radiation Protection and Measurement, a highly regarded scientific organization founded in 1921¹¹⁶ to represent the professional interests and knowledge of radiation physicists and physicians in radiologic medicine.

Although it does not have any official standing as a government agency, its publications and handbooks are relied on as if it were. In addition to the National Council on Radiation Protection and Measurement, the Atomic Energy Commission was assisted by the Federal Radiation Council which was established on August 14, 1959 by Executive Order¹¹⁷ and is now part of the EPA. The Federal Radiation Council is composed of the Secretaries of Defense, Commerce and HEW and the Chairman of the Atomic Energy Commission and the Administrator of the EPA. The Special Assistant to the President for Science and Technology is authorized to participate in its deliberations, and each executive agency represented on the council, as well as every other federal agency, is to give the council whatever technical and other assistance it may need. The purpose of the council is to advise the President with respect to

...radiation matters directly or indirectly affecting health, including matters pertinent to the general guidance of executive agencies by the President with respect to the development of such agencies of criteria for the protection of humans against ionizing radiation applicable to the affairs of the respective agencies. The Council shall take steps designed to further the inter-agency coordination of measures for protecting humans against ionizing radiation.¹¹⁸

The federal standards for radiation protection and for the management of radioactive wastes have retained their unquestioned authority in spite of the passage in 1959 of a far-reaching amendment to the Atomic Energy Act which provided for cooperation with the states.¹¹⁹ What was of particular interest in the 1959 amendment is not the fact that the states were given an opportunity

to share in the development of atomic energy, but that, despite the provision for federal-state cooperation, the entire effort was to be on terms laid down by the federal government. Moving from a position of absolute preemption, the amendment authorized the Atomic Energy Commission to enter into agreements with the governor of any state to arrange for the discontinuance of the regulatory authority of the commission under certain subchapters of the Atomic Energy Act. Aside from the fact that no general delegation of authority to deal with atomic energy was granted to the states, but rather a limited authority to act within a narrow sphere, defined in each instance by separate agreement, the law is clear that certain areas that involve secrecy or major risks may not be delegated to the states under any circumstances. Among the subjects which may not be delegated is the disposal into the oceans of specified nuclear waste materials.

An agreement delegating to a state certain regulatory functions with respect to nuclear energy may be entered into only if the government of the state certifies that it has "a program for the control of radiation hazards adequate to protect the public health and safety with respect to materials within the state covered by the proposed agreement. . ."¹²⁰ Moreover, to enter into such an agreement the commission must find that "the state program is compatible with the commission's program for the regulation of such material, and that the state program is adequate to protect the public health and safety with respect to the materials covered by the proposed agreement."¹²¹ The effect of this limited

delegation has been to make the federal radiation protection standards the dominant ones in the field.

Until the recent past when two separate attacks were leveled against them, there had never been any substantial criticism of the adequacy of federal radiation standards. The first attack, by Dr. John W. Gofman and Dr. Arthur Tamplin of the Biomedical Division at the Lawrence Radiation Laboratory in California, charged that the emission standards were entirely too low, and that, given the current population of 200 million, if there were a more than 20 percent contribution to U.S. power needs from nuclear power plants yielding the maximum emissions permitted by the Atomic Energy Commission, 16,000 radiation deaths a year would result.¹²² It is expected that by the year 1980, 20 percent of the power needs of this country will be met by nuclear reactors.¹²³ This attack has been rejected by the Atomic Energy Commission¹²⁴ and by the Chairman of the National Council of Radiation Protection and Measurement.¹²⁵ Basically, the difference of opinion revolves around the issue of whether radiation in any amount is damaging, or whether there is a threshold tolerance for radiation for the population at large. The other attack on the federal standards has come from the State of Minnesota which has sought to impose higher radiation emission standards to permit the siting of a new nuclear installation, in spite of the fact that an Atomic Energy Commission license had already been obtained for the particular site. This matter is presently pending.¹²⁶

FEDERAL ENVIRONMENTAL REGULATION--IN GENERAL

It is evident from the brief survey of the role of the federal government in setting standards and in making regulations for environmental control that most areas have developed along similar lines. Since most aspects of environmental pollution initially appear as subjects appropriate for regulation under the states' police power, the federal interest initially has been to bolster the exercise of the states' and the localities' power through grants-in-aid, grants for research and development, and grants for inter-governmental cooperation in dealing with environmental pollution. As it has become apparent in area after area that environmental problems are not easily susceptible to state or local resolution, but are indeed of regional or national scope, the federal interest has been enlarged and the federal government has taken on more and more of the burden of standard setting and regulation. As will presently appear, standard setting and regulation have not necessarily brought about a more direct federal involvement in enforcement activities for, on the whole, the federal government has traditionally sought to work through state and local instrumentalities in the control of the environment. It is also clear that federal standards --whether direct regulatory standards as in the case of radiation pollution or automotive emission standards or indirect regulation through the use of the grant-in-aid device--have had an enormously stimulating effect on the states' and localities' own standard setting and rule-making endeavors. Since the passage of the

Air Quality Control Act of 1967, when the federal government first set motor vehicle emission standards, for instance, some 28 states have enacted legislation to deal with vehicle pollution.¹²⁷

It is evident, too, that many of the state regulations for water pollution control were passed in response to federal grants conditioned on the states' enforcing appropriate standards, as provided in the 1965 Water Pollution Control Act.¹²⁸

Another aspect of federal involvement in environmental controls needs to be mentioned. Until very recently, with the passage of the Environmental Policy Act of 1969,¹²⁹ the federal concern for the regulation of environmental pollution has proceeded on a totally piecemeal basis, with each environmental problem being taken up in turn, often without regard to its impact on other aspects of environmental quality. Aside from regulatory controls in the area of air pollution, water pollution, noise pollution, etc., the federal government's own involvement in programs that have significant environmental impact, such as highway, airport and research development activities, has proceeded separate from, and without regard to, the policies implicit in some of the regulatory efforts. The lack of coordination between regulatory programs on the one hand and the broad developmental programs on the other raises a significant question relating to the consistency of federal environmental policy. Unless federal programs with broad environmental implications can be reconciled with federal regulatory efforts in the control of the environment, no sustained coherent

federal environmental policy will emerge.

If the Environmental Policy Act of 1969 is to have any purpose whatever, it will be to fulfill that need. But the Environmental Quality Council, created under that Act, has no regulatory power, although it has broad scope to investigate and coordinate the efforts of other agencies.¹³⁰ Although the creation of the Council is a promising development, it is of course too soon to evaluate the potential of this new organization. If the Council is to serve any function, it will have to address itself particularly to the question of a general federal environmental policy that harmonizes the federal government's own developmental activities with the regulatory purposes of federal legislation that deals with water pollution, air pollution, and other injuries to the environment.

The Role of the States and Municipalities in Standard-Setting

The states and localities have dealt with environmental problems under the states' police power practically from the beginning of time. Much of what is presently referred to as environmental legislation finds its origin in rather primitive early regulations promulgated in the state or local sanitary code as part of the regulation of the public health. So, for instance the origins of air pollution control can be traced back to early colonial legislation and to even earlier English regulations that dealt with smoking chimneys and the nuisance created by smoke, fly ash and cinders.¹³¹ The origins of water pollution controls may

also be found in the early local regulations which prohibited a man from placing his cesspool too close to his own or his neighbor's well.¹³² Frequently, such regulations preceded even the scientific knowledge which would have justified them, for the placement of a well near a cesspool was regarded as dangerous even prior to the knowledge that insufficient filtration could cause contamination of the well from the cesspool. So, too, local regulation of noise nuisances antedates by many years the clear evidence that excessive noise results in hearing loss. Thus, there has never been any real question that the states or the municipalities, by delegation from the states, had the power to enact laws or regulations that protect the health, safety and welfare of the people against adverse effects of environmental pollution.

AIR POLLUTION CONTROL

It is of course a long way from a local smoke ordinance to a sophisticated state or municipal air pollution control code. Generally the states and localities developed such codes in response to federal grant-in-aid programs that made it desirable for them to do so. So, for instance, following the initial federal air pollution legislation in 1955 which provided funds for research and development, the Council of State Governments first called the states' attention to the need for air pollution regulations and proposed some general standards through appropriate recommendations of one of its governors' conferences.¹³³ Today, almost all states have enacted state air pollution

control legislation, some of the most recent enactments having occurred in response to the 1967 Federal Air Quality Act.¹³⁴ Typically the state laws designate a state agency or establish a new commission to promulgate standards and codes.¹³⁵ In most states the enforcing agency is the state health department,¹³⁶ although in some states separate air pollution control agencies have been created.¹³⁷ Most of the state laws allow local governments to enact air pollution codes or regulations of their own, but do not generally require it. A number require the state agency, board or commission to encourage local units of government to handle air pollution programs and to provide them with technical advice and assistance.¹³⁸ Under most state laws local units of government are empowered to enact laws or ordinances regulating air pollution, but the standards set by such local units must be consistent with, or more stringent than, the state regulations. A few states have even more detailed provisions to insure a coordinated state-local effort. In Florida, for instance, the state agency must review local standards before they become effective;¹³⁹ in Colorado the law requires a mutual review--local units must review state regulations and the state agency must review the local regulations before either becomes effective.¹⁴⁰ In some states, county and other governmental units are given the authority to study and investigate pesticide problems and to report them to the central air pollution control agency for review and action.¹⁴¹ A few states, too, require municipalities and other local governments to participate in area-wide regulation, or

else to become subject to direct state regulation.¹⁴² Regional cooperation is authorized and provided for in many states' air pollution control laws, though none of them expressly require it.¹⁴³

A recent draft of model state air pollution control legislation proposed by the Council of State Governments¹⁴⁴ requires local regulatory action by state law in a direct and effective fashion. Section 14 of the proposed law requires municipalities to establish and administer air pollution control programs. Local standards must be stricter than, or at least consistent with, those of the state and must provide for administrative and judicial sanctions. Moreover, the state agency is required to approve the program. If the local unit of government does not act, or if it does not carry out its responsibilities adequately, the state may, after a hearing, administer the program directly, and may charge the local unit for the expense. Interlocal cooperation is provided for, and the state agency may require area-wide air pollution control programs where considered necessary. If the local units of government do not cooperate in the establishment or administration of such a regional program, the state is authorized to administer the program directly. Finally, if the state agency determines that a particular class of air pollutants is more amenable to state regulation than local regulation, the state may assume exclusive jurisdiction.

The proposed model state air pollution control act is significant in that it deals with a number of problems that have arisen in state air pollution control

programs and that existing legislation has failed to address. Generally, state and local air pollution control programs are structurally independent of one another. While the state theoretically exercises supervisory control over local programs, in fact there is considerable disjunctiveness both on the standard setting and on the enforcement level. The state generally exercises little or no supervision over the standards promulgated by local air pollution control agencies and the question of inconsistency between state and local standards is not likely to be raised at all unless a person charged with violating the local code raises the issue in defense to a criminal prosecution or other enforcement action. The disjunctiveness of state and local air pollution control programs within a single state is even more sharply pronounced in the area of enforcement and will be referred to in greater detail in that context.¹⁴⁵

Originally, one of the most troublesome aspects of state and local air pollution control programs was the composition of the air pollution control agency empowered to set standards and make regulations. Normally state and local air pollution control agencies operate on well-established administrative law principles. The agency is established by law and is given power to promulgate an air pollution control code consisting of emission standards and such other standards as the enabling legislation may refer to in a general fashion. The enabling legislation normally prescribes the membership of the commission or board that is empowered to promulgate the code or other standards under the law.¹⁴⁶

It has been the practice in air pollution control legislation to give substantial representation to the very industries that were the most serious polluters. For many years, membership in standard setting boards in many of the states was based on something of a tripartite formula, with industry having approximately one-third of the seats and with the public, labor groups, and professionals with specific knowledge or interest in air pollution technology holding the other two-thirds.¹⁴⁷ Most of the professionals who were likely to be knowledgeable in air pollution control matters, however, were either employed by industry or were closely identified with industry's point of view. Consequently, many states' air pollution control agencies were for a long time industry-protection oriented, and would not recommend air pollution control measures that were costly or otherwise objectionable to industrial polluters. Moreover, state air pollution control legislation often contained safeguards from the very beginning that were protective of industry.¹⁴⁸ Provisions that require the agency to set air pollution control standards, taking into account "economic feasibility," were especially likely to result in standards that permitted economic factors to outweigh the claims of public health.¹⁴⁹

State and local air pollution codes differ widely with respect to coverage and technical sophistication. On the most primitive level, all of them deal with visible emissions and set limits (usually in terms of the Ringelman chart) in terms of the density of emissions.¹⁵⁰ Most codes go beyond this primitive smoke-

emission standard and deal also with gaseous emissions, whether visible or not.¹⁵¹ On a yet higher level stand the codes that relate the amount of emission to the amount of heat produced by the apparatus--in effect, requiring minimal standards of heating efficiency.¹⁵² Other, more advanced regulatory approaches limit certain harmful particulate emissions, including process dust, often relating the amount of permissible emissions to the weight of the bulk involved in the manufacturing process.¹⁵³ More advanced codes, moreover, impose not merely emissions standards, but also fuel standards, reflecting an appreciation of the fact that the nature of the emission is directly related to the nature of the fuel.¹⁵⁴ Finally, the most advanced codes provide for a system of permits and licenses both for the construction of factories, power plants, or other pollution producing installations, and for their operation.¹⁵⁵ The considerable variety in the nature of air pollution control codes is significant because the more sophisticated the code, the more complex the monitoring system, and the more highly trained the personnel required for its enforcement. Particularly in smaller municipalities, the means for the enforcement of a sophisticated code are not likely to be available. In consequence, there are serious limits on the capacity of a local air pollution control agency, for instance, to enforce a highly technical and sophisticated state air pollution control code.

WATER POLLUTION CONTROL

The history and development of state and local controls in the area of water pollution is again not too dissimilar from that in the area of air pollution. As in the case of air pollution, water pollution control by states and localities is based firmly on the police power.¹⁵⁶ Initially the individual had no realistic protection against water pollution beyond the possibility of a suit for damages and injunction against an upstream polluter.¹⁵⁷ And even private litigation suffered from the absence of any generally accepted standards of water purity against which to measure the degree of pollution.

Initial steps towards governmental control of water pollution came in the form of measures to protect domestic drinking water supplies¹⁵⁸--as for instance, the sanitary regulation, previously referred to, that prohibited the placing of one's cesspool too close to one's neighbor's well. Other measures of similar nature took the form of statutes that made the dumping of offal and refuse into the waters a criminal offense.¹⁵⁹ Municipalities were often granted extraterritorial powers to abate pollution contaminating municipal water supplies,¹⁶⁰ and local boards of health were empowered to monitor the quality of water used for domestic purposes.¹⁶¹ Frequently, however, local success in keeping water supply pure was often achieved by sending wastes downstream, thereby harming other localities.¹⁶²

As pollution became more severe and its threat to the

public interest became more apparent, the need for comprehensive state action was realized. In this second evolutionary step, several state agencies were typically given pollution control authority in their respective spheres of operation.¹⁶³ Where a single agency was assigned primary responsibility it was usually the state health department.¹⁶⁴ This assignment reflected the public concern of the times which focused almost exclusively upon the public health aspects of water pollution. Hines summarizes the main faults of this period as being: (1) inadequate statutory authority, (2) lack of forceful administration, (3) inappropriateness of the public health dominion, and (4) lack of centralized authority.¹⁶⁵ These shortcomings became apparent whenever concerted action was required.¹⁶⁶

The present practice is to create a single state agency and to assign to it the authority to make the major policy decisions relating to all aspects of water quality control.¹⁶⁷ In many states a number of agencies with lesser jurisdiction antedated the creation of the single dominant state agency. Many states, therefore, were faced with the choice of either creating an entirely new agency to assume jurisdiction from all existing ones, of creating a special statutory coordinating board or commission, or of singling out one of the existing agencies and granting it dominant powers over all other water pollution control agencies in the state. An example of the first type of agency is the Texas Water Quality Board. Directed by law to "set water quality standards for the waters in the state. . .,"¹⁶⁸ it in effect has achieved major master planning functions in

the water areas for the state as a whole. The board is composed of seven members, of whom three are appointed by the governor and confirmed by the Senate; the four others are the chief executives of the Texas Water Development Board, the health department, the Parks Department and the Railroad Commission.¹⁶⁹ Generally, the appointed members are community leaders.¹⁷⁰ An executive director, who is full-time, operates as liaison for the part-time board members and supervises the execution of policies through an appointed staff.¹⁷¹ Florida, which had initially entrusted water pollution control powers to the Department of Health, ended up by creating the Florida Air and Water Pollution Control Committee, composed of the governor, the secretary of state, the commissioner of agriculture, and two additional members appointed by the governor and confirmed by the senate.¹⁷² Provision is made for a director with qualifications in bio-environmental or sanitary engineering.¹⁷³

The coordinating committee approach is exemplified by Oklahoma. There the department of pollution control, created in 1968, consists solely of the pollution control coordinating board and of any special task forces that might be assigned to the department.¹⁷⁴ The pollution control coordinating board consists of the chief administrators of the five enforcement agencies--the Oklahoma Water Resources Board, the corporation commission, the state department of health, the state department of agriculture and the state department of wildlife conservation. The board's primary function is to coordinate the efforts of the various agencies in

order to avoid duplication of effort and to promote efficient pollution abatement. The board was granted authority to prescribe water quality criteria, standards of water quality and the beneficial uses of the state's waters.¹⁷⁵

The third approach of vesting control powers in existing agencies was adopted in New York. The New York Public Health Law gave the water resources commission the power to classify waters and to adopt standards. The enforcement of the program, however, was delegated to the State Department of Health. The Water Resources Commission, though it promulgated classifications and standards for the Department of Health to enforce, was an independent body nominally within the structure of the Conservation Department.¹⁷⁶ In April, 1970, New York abandoned this structure, transferring the functions of the Water Resources Commission and the Conservation Department to a newly created Department of Environmental Conservation which has general standard-setting and enforcement authority in environmental matters.¹⁷⁷

A number of state water pollution control efforts have been criticized on structural grounds--it is said that separating standard setting and rule making powers from enforcement powers has proved unsatisfactory. According to this view, the coordinating committee would seem likely to be the least effective form of agency since by definition it has coordinating powers only and may not enforce directly. Conversely, a centralized agency, such as that of Texas, with its own staff and extensive enforcement authority, is

likely to be far more effective. It has been charged, for instance, that the reason for the lack of effectiveness of the old New York law was the absence of close coordination and cooperation between the Water Resources Commission, the policy maker, and the Department of Health, the enforcement agency.¹⁷⁸

The implications of separating standard setting and rule making from enforcement responsibilities ought to be taken into account when considering the recent trend towards the establishment of coordinating and standard setting agencies for environmental controls at large. There is evidence that the establishment of coordinating agencies, or the separation of policy making from enforcement activities is of dubious effectiveness even within any one field of pollution control, such as water or air pollution. Why, then, should there be greater effectiveness expected of a state-wide pollution control agency with responsibility for policy-making in water pollution, air pollution, noise pollution, solid waste disposal and all the rest, but leaving enforcement responsibilities to specific divisions within the overall pollution control agency? That is not to say, however, that inter-agency coordination is not both desirable and necessary. It is true, for instance, that water pollution problems cut across many lines of interest and require many different kinds of technical knowledge.¹⁷⁹ Even a unified water pollution control department may find it difficult to administer its program if it does not take cognizance of the expertise and interests of other agencies.

The composition of water pollution control boards differs from state to state but, just as in the case of air pollution control boards, follows a number of set patterns. When a board's function is primarily advisory, the representation of interests on the board is likely to be very broad,¹⁸⁰ although some advisory boards consist wholly of officials of state agencies involved in various aspects of water pollution control, serving on the board ex officio.¹⁸¹ In many instances advisory boards or boards charged with standard setting functions consist of officials of enforcement agencies and of persons representing interests most directly concerned with the regulation of pollution.¹⁸² Ordinarily, when a water pollution control body has not only supervisory or standard setting authority but also exercises enforcement functions, it is likely to be composed primarily of agency officials.¹⁸³ The question of whether or not it is desirable to include members of the regulated industry on a standard setting or rule making body has been previously referred to in the context of air pollution regulation. It has been suggested in the context of water pollution control that the members of the regulated industry, who are likely to be the major contributors to the pollution that is sought to be regulated, should not be given an official position in the standard setting agency because their views have usually been adequately represented in the legislature in the course of legislative hearings, and by counsel in board hearings on proposed regulations. It is likely that in water pollution

standard setting agencies, just as in air pollution standard setting agencies, the presence of industry board members has hindered the regulatory effort by at least as much as it has advanced it.¹⁸⁴

State agencies differ considerably with respect to their jurisdictional scope, and this of course has considerable implications for the kinds of standards and the reach of the regulations that they may impose. Some state statutes limit agency jurisdiction by giving it regulatory control only over specified waters, or by exempting certain waters from regulation.¹⁸⁵ Other states exempt ground water pollution thereby ignoring the integral relation between the quality of ground waters and surface waters.¹⁸⁶ The more up-to-date and comprehensive statutes generally and expressly include all waters within the pollution control effort.¹⁸⁷ The presence of certain political and economic pressures is clearly visible on the face of certain of the water pollution control statutes. Thus, for example, Pennsylvania makes its act applicable only to sewage and exempts from coverage all wastes from coal mines, tannery and municipal sewage systems existing at the time the act was passed.¹⁸⁸ Sometimes, too, the regulatory scope of the law is limited by a very narrow definition of the wastes capable of creating a condition of pollution.¹⁸⁹ It is clear that inclusive coverage is not difficult to achieve statutorily through a broad grant of jurisdiction and a liberal definition of activities to be regulated.¹⁹⁰

State agencies' powers differ considerably with

respect to the kind of water quality standards they may impose. Though on their face modern state water pollution control laws grant broad powers to the control agency,¹⁹¹ not all of them grant full powers to the agency to set water quality standards across the board. Many states that have the power to establish water quality standards are approaching the task in gradual stages. Some states have never gotten beyond the promulgation of broad minimal standards, while other states have not set state-wide standards but have proceeded area by area.¹⁹²

The New York law and the regulations promulgated under it offer a good example of a comprehensive program of water classification and the adoption of quality standards. The waters are classified on a "best use" basis, which means that the existing or potential use requiring the highest degree of purity is used to set the standard.¹⁹³ Public hearings are required in the standard setting process. Standards of purity are assigned to the various rivers and streams based on the following criteria:

1. Stream characteristics, including size, temperature, and drainage area;
2. Character and use of the surrounding area;
3. Existing and potential uses of the stream; and
4. The extent of present defilement or pollution.

In order to avoid standards from becoming permanently fixed at too low a level of quality, the New York Water Resources Commission had the power to repeal, modify, or alter standards from time to time. The water classification program in New York has been attacked as an

unconstitutional delegation of legislative authority. The constitutionality of the law and the regulations were upheld, however, by the highest court of the state.¹⁹⁵ Similar water classification schemes have been upheld in other states against constitutional attacks based not only on improper delegation but also on due process and equal protection grounds.¹⁹⁶

Where a state's water pollution regulations have been adopted, there is relatively less scope for rule making on the local level, except insofar as such local regulatory efforts may be expressly sanctioned or authorized by state law. In the main, however, the local regulatory effort is likely to support the state effort by assisting the municipality in meeting the requirements imposed on it by state law. This happens to be one of the unusual areas of the law in which local governments have been sued by state water pollution control agencies to compel compliance with state regulations. This is particularly true in instances where the locality has failed to provide adequate sewage treatment facilities to treat raw sewage before it is discharged into one of the state's waterways.¹⁹⁷

In many localities local subdivision regulations require developers of entire subdivisions or developers of sizeable tracts to provide for community disposal systems and for community-operated treatment plants instead of individual septic tanks.¹⁹⁸ The aim is to help meet the state's water purity standards. In many jurisdictions, developers may not proceed with building operations until the local

agency has been assured--by way of submission of plans for certification--of the developer's intention to make adequate provision for sewage treatment in his development.¹⁹⁹

In water pollution control there has been far closer correlation between state and local agencies than in air pollution control. The reason probably lies in the different character of water and air pollution. In the case of water pollution the problem is generally well defined by a river bed which touches many municipalities within the state. Consequently, the failure to conform on the part of one municipal agency becomes immediately apparent not only to the state agency but to all other municipal agencies downstream. The problem of air pollution is far less well defined because air pollution, though it may move with prevailing winds, does not move in clearly defined channels, and the contribution of any one municipality to the total amount of air pollution in a region is not only difficult to gauge but also difficult to prevent. Consequently, disjunctiveness of effort in the air pollution control field is less likely to become immediately apparent than would be a similar disjunctiveness of effort in water pollution control.

SOLID WASTE DISPOSAL

Other areas of environmental control, such as solid waste disposal and noise control are by their nature far more local in character, and in each instance the federal concern is thus far reflected primarily in

grants-in-aid legislation for research and development and, to a far more limited degree, in federal regulations.²⁰⁰ Solid waste disposal has been handled thus far by local regulation, generally subject to state enabling legislation.²⁰¹ The manner in which solid waste is to be collected, the manner in which the householder is to store his solid waste and get it ready for collection is generally treated in state or local sanitary, health,²⁰² or housing codes.²⁰³ The subsequent disposition of wastes collected by municipal sanitation departments or by private garbage collectors is also regulated by local ordinances, subject again in most instances to state enabling legislation.²⁰⁴ Thus the proper method for sanitary landfills and the required quantity of clean soil to bury waste are regulated by state or local health codes.²⁰⁵ The manner in which wastes may be incinerated, either in a municipal incinerator or in a privately operated incinerator, or by burning on the lot, is generally subject to state or local air pollution control regulations.²⁰⁶ What is noteworthy in this context is the fact that the relationship of solid waste management to air pollution control or to water pollution control is not articulated in any state law or regulation--in spite of the fact that some jurisdictions have had that connection brought to their attention--rather forcefully--as in New York, where an order to shut down apartment house incinerators led to a garbage removal crisis.²⁰⁷

The statutory treatment of solid waste disposal is also interesting, in that it appears to be concerned to

a far greater extent with the economic rather than the environmental aspects of the problem. Provisions for the issuance of bonds for incinerators and other disposal systems abound, and special districts for this purpose are sometimes authorized.²⁰⁸ In large cities, considerably more attention is devoted to the licensure of private garbage collectors--a sometimes racket-ridden industry--than to the sanitary aspects of waste collection and movement.

On the whole, state laws relating to solid waste disposal exist in their own statutory compartment just as does water pollution and air pollution control legislation.²⁰⁹ While some states are beginning to reflect the recognition of the interrelationship of different aspects of environmental pollution through the establishment of coordinating committees and agencies of various kinds, no effective means appears to have been found as yet to reflect the close interrelationship of these matters in operative regulations.

NOISE POLLUTION CONTROL

The subject of noise regulation is in some respects unique; though there has been some recent federal development in the area,²¹⁰ the states and the municipalities have on the whole dealt with quite distinct aspects of it. State regulation of noise is essentially limited to muffler legislation intended to reduce noise produced by motor vehicles,²¹¹ and to regulations relating to industrial noise for the protection of workmen.²¹² Aside from these two separate areas, the regulation of noise has been largely a local

responsibility, and the local regulation involved has been of a rather minor kind, namely the establishment of miscellaneous prohibitions collected in local codes under some such heading as "police ordinances."

Usually these are composed of matters too trivial to appear in the state's general code, and they generally concern matters too neglected in modern times to be included in public health law or the like.

The fact that the states have generally not legislated against noise and that such local laws as exist are largely recom compilations of old ordinances, suggests that very little attention is presently being paid to the problem, and that there is little expectation that the local laws will be actively enforced. This point is substantiated by looking at the anti-noise laws in a few American cities. In New York City, the relevant provision of the Administrative Code prohibits "the creation of any unreasonably loud, disturbing, or unnecessary noise" or of "noise of such character, intensity and duration as to be detrimental to the life or health of any individual."²¹³ This is followed by a list of specific acts that "among others" shall be deemed to be violations of the general prohibition. Some of these themselves are phrased in terms of "loud" or "unnecessary" or "disturbing" noises of various kinds. Included, too, are such concrete examples as horn blowing, except as a danger signal, failure to use a muffler, and construction work between 7 p.m. and 6 a.m. on weekdays except by special permit. Other provisions regulate sound trucks and other amplifying devices used in public.²¹⁴

Philadelphia's code of ordinances prohibits unnecessary noise in the handling of trash cans, and construction work between 6 p.m. and 6 a.m. It also contains special provisions to protect the quiet of hospitals, churches, court houses and schools, and prohibits the use of outdoor amplifying devices for advertising purposes, unnecessary horn blowing and "all other loud and unnecessary noises upon or near to the streets or other public places in the city," and provides for the regulation of street peddlers.²¹⁵ Chicago, in addition to some of the more standard provisions, provides that "rails, chimneys, and columns of iron, steel, and other metal which are being transported on the public ways of the city" shall be loaded so as to avoid the creation of loud noises.²¹⁶

What all of these city ordinances lack is a coherent scheme of noise control. Typically they are collections of specific prohibitions drafted and enacted from time to time by the local legislative body in response to some special problem, and not subject to revision, review and updating by an administrative agency having the requisite expertise to deal with noise problems in a consistent fashion. There are, however, some notable improvements on the horizon. Modern zoning ordinances, especially the 1960 New York City Zoning Resolution, deal with industrial noise and similar environmental insults, such as vibrations, not only by the ordinary zoning technique of requiring separation of incompatible uses, but also by imposing specific performance standards for the more frequent

lutants. Thus decibel standards for particular zones imposed to set permissible standards for noise, as standards for vibrations, smoke, dust and other particulate air pollutants, odor, toxic emissions, and explosive hazards and other onerous environmental hazards are dealt with in relation to the use of particular zones for designated purposes.²¹⁷ A modern zoning ordinance also can, and should, deal effectively with the problem of effective airport zoning. Certain facilities--such as schools or hospitals--should be excluded from neighboring zones unless properly sound-proofed. Imaginative use of the zoning power can protect the airport without placing a complete bar on other development in the area.

At least two building codes, in New York²¹⁸ and in New Jersey,²¹⁹ require sound insulation in new buildings as a condition of a building permit or a certificate of occupancy. In addition to requiring adequate sound insulation against noise from outside the building or from other parts of the building, these codes also provide for adequate protection against noise sources from within the building itself--i.e., ventilation and heating equipment, elevators, ducts and other machinery and facilities.

Unlike earlier municipal noise regulations which were enacted from time to time by municipal legislatures, these newer regulatory efforts are not only more comprehensive but are also the result of technical work done by knowledgeable and technically qualified administrative agencies with special competence in the field.

The Role of the Federal Government in the Enforcement and Administration of Environmental Regulations

While there has been a gradual move towards the consolidation of standard setting responsibilities at higher levels of government, the major responsibility for seeing that air pollution, water pollution and other environmental standards are actually enforced rests at the lower level of the governmental hierarchy.²²⁰ In part, the fact that the responsibility for enforcement activities is not centered at the federal level reflects the earlier assumption that environmental controls are primarily a local responsibility. In part, too, the primary emphasis on enforcement powers at the local or state level reflects the realistic appreciation that there is local and state enforcement machinery--i.e., a staff of inspectors and a force of clerical back-up personnel--while there are very few federal enforcement officials who are concerned with matters of day-to-day enforcement against individual violators of the standards, rules and regulations.

The consequence of a predominantly local emphasis in enforcement is that in air pollution and water pollution control, as well as in any number of other areas of environmental protection, federal enforcement against persons who violate standards is not only infrequent but is viewed as a rather extraordinary measure. Thus under federal air pollution legislation there were virtually no federal enforcement powers prior to the Clean Air Act of 1963, which, for the first time,

provided for abatement procedures for interstate air pollution.²²¹ The 1967 Air Quality Standards Act retained these abatement procedures and added one or two others which clearly and on their face indicate that they, too, were remedies reserved for extraordinary or extra-hazardous situations.²²²

As presently constituted, federal law provides for federal abatement procedures in four separate situations. If solely intrastate air pollution is involved, the Administrator of the EPA may take action only if requested by the governor of the affected state. But he may not proceed if he determines that the effect of such pollution is not of such significance as to warrant the exercise of federal jurisdiction. This section is inapplicable to interstate air pollution.²²³

A second procedure, added in 1967, authorizes the Administrator to seek immediate court action to stop emission of pollutants where there is evidence of "imminent and substantial endangerment to the health of persons" and where state or local authorities have failed to act.²²⁴ The section is intended as a remedy for emergency situations only, and the Congressional intent embodied in the House Report that accompanied the legislation was clearly to make the remedy inapplicable as a continuing control for chronic or generally recurring problems of less than calamitous nature.²²⁵ Local authorities do not have the power to require the Administrator to act under this section. The Congressional intent regarding the section was clearly to have it used only in such extraordinary situations as, for example, the incidents in Donora,

Pennsylvania in 1948, in New York City in 1953, and such incidents as the London killer smogs of 1952 and 1962.²²⁶

A third procedure is provided for if the interstate air pollution occurs in an air quality control region with established air quality standards.²²⁷ Federal enforcement is authorized only if the Secretary finds that air quality has fallen below the prescribed standards, and that the state itself has failed to take reasonable action to implement and enforce the applicable standards.²²⁸ While the Administrator may act on the basis of the complaint from one of the states affected, he is not required to act on the basis of such a state complaint, and it is up to him to determine whether the state complained of has or has not taken "reasonable action" to bring about abatement. First provided in the Air Quality Act of 1967, the procedure was never invoked by the Secretary of HEW and has not as yet been used by the Administrator.

Finally, the fourth procedure which may bring the federal government into an active enforcement role is that which was initially provided by Section 105 of the Clean Air Act of 1963. The procedure is applicable only in instances of interstate air pollution where the source of the pollution is in one state and the adverse effect in another. The Administrator is required to call a conference whenever requested to do so by the governor or by a state air pollution control agency of one of the states affected, or with their concurrence, by a municipality, if there is evidence of

air pollution "which is alleged to endanger the health or welfare of persons in a state other than that in which the discharge originate(s)."²²⁹ The Administrator is also free to call a conference on interstate air pollution on his own initiative after consultation with the officials of the affected states.²³⁰ It is noteworthy that this is the only instance under the law in which a state or municipality can require the Administrator to act. However, an individual citizen cannot require him to act under this or any other federal enforcement provision.

When a conference is called by the Administrator, the interstate, state and local agencies involved participate in it, and an appointee of the Administrator presides. The person responsible for the discharge may be invited by one of the member agencies, but there is no legal requirement that he attend the conference, and it has been held that due process does not require his presence since the conference is neither rule-making nor adjudicative.²³¹ The conference meets on thirty days' notice accompanied by a preliminary report made by HEW. Advance notice is also given to the public by publication on at least three different days in a newspaper of general circulation in the area.²³² The conference itself is informal and does not have the character of an administrative hearing.²³³ Following the conference, HEW prepares and distributes a summary of the conference discussions, and the Administrator may recommend necessary remedial action. The law provides that the polluter must be allowed six months to take the remedial actions recommended. If six

months later the Administrator is dissatisfied with the progress made, he may call a formal public hearing before a hearing board of five or more persons appointed by him. Each of the states affected may choose one member, and each federal department which the Administrator determines has a special interest in the matter may choose one member. One member must be a representative of an appropriate interstate air pollution control agency, and a majority of the members must be persons other than officers or employees of HEW.²³⁴ The appointment of a formal hearing board is entirely at the discretion of the Administrator,²³⁵ and the complaining state or municipality has no role in the initiation of this step. All interested persons must be given an opportunity to present evidence at the hearing, and the board makes recommendations for affirmative action to abate the pollution on the basis of the evidence presented. The findings and recommendations of the board are forwarded by the Administrator to the alleged violator and to the agencies involved, together with a notice specifying a reasonable time of not less than six months for compliance.²³⁶ Neither the board nor the Administrator has been granted authority to issue a binding order following the hearing, and the Administrator is not authorized to impose any sanctions for the violator's failure to comply with the directives of the conference. It has been held that, though more formal in character, the hearing is not adjudicative and the alleged violator cannot obtain a judicial review at this stage for he has not as yet been subjected to any legally binding

order.²³⁷ If the alleged violator, however, fails to comply with the hearing board's directions within the time set for such compliance, the Administrator may then ask the Attorney General to file suit in the federal district court to secure abatement.²³⁸ This is the first and only instance in the lengthy procedure that a sanction has been provided for failure to comply. However, the complaining state or municipality cannot require the Administrator to take this step. Whether or not the Administrator decides to ask the Attorney General to file suit is again left entirely to his own discretion. When suit is brought, the court may receive any transcript of the proceedings before the board and a copy of the board's recommendations, along with any other evidence which the court deems proper.²³⁹ The board's findings and recommendations will not be received as evidence to prove any facts recounted in them, but will be evidence only as to what the public interest and the equities of the case may require. Both the government and the defendant have an opportunity to produce additional evidence.²⁴⁰ The court considers all pertinent factual and legal issues de novo and in making its determination,

The court, giving due consideration to the practicability of complying with such standards as may be applicable and to the physical and economic feasibility of securing abatement of any pollution proved, shall have jurisdiction to enter such judgment, and orders enforcing such judgment, as the public interest and the equities of the case may require.²⁴¹

Although this procedure has been available since the enactment of the Clean Air Act of 1963, its effectiveness

has been minimal. It is most cumbersome and slow, and in the past seven years it has been invoked in only nine interstate areas.²⁴² In only one instance, moreover, has the case gone beyond the conference recommendation stage, i.e., beyond the very first formal step. That case involved the Bishop Processing Company of Bishop, Maryland, which was charged with emitting such vile odors from its chicken offal processing plant as to endanger the health and welfare of persons in Selbyville, Delaware, two miles distant. In that case, administrative proceedings were initiated by a request from the Delaware State Air Pollution Authority which, with the state of Maryland, had been engaged in futile efforts since 1959 to induce Bishop to abate its pollution. A formal hearing was subsequently held in May of 1967 after the company had failed to make satisfactory abatement efforts. The company was directed, following the hearing, to abate the pollution by December, 1967. On July 28, 1968, some two and a half years after the proceedings had begun, the district court in Maryland denied the company's motion to dismiss the government's suit seeking abatement. In the fall of 1968 the Bishop Company agreed to a settlement requiring it to cease operations upon the filing of an affidavit by the Delaware Water and Air Resources Commission, stating that the company was causing air pollution in Delaware. The affidavit was not filed until March of 1969. In September an order was issued directing the company to cease operations. The order was, however, stayed

during Bishop's appeals to the Court of Appeals and Supreme Court and did not become final until spring of 1970--five years after the inception of the federal procedure and eleven years after the state governments first became concerned with the situation.²⁴³

The range of federal enforcement powers under federal water pollution control legislation, as amended by the Clean Water Restoration Act of 1966, is similar to--and appears to have been copied from--that in the air pollution area. The bases for federal intervention, closely paralleling those in air pollution, are: (1) pollution of interstate and navigable waters in or adjacent to any state or states that endangers the health or welfare of any persons, (2) a governor's request for federal intervention when pollution in one state affects the health or welfare of persons in another, "unless the effect of such pollution on the legitimate uses of the waters...is not of sufficient significance to warrant federal jurisdiction."²⁴⁴ In addition, action may also be instituted when the Administrator of the EPA has reason to believe that pollution in interstate or navigable waters creates substantial economic injury resulting from inability to market shellfish or shellfish products in interstate commerce, and, finally, whenever the Administrator has reason to believe that pollution of interstate or navigable waters endangers the health or welfare of persons in a foreign country and the Secretary of State has requested him to abate

such pollution.²⁴⁵ The procedure consists of three stages. First, a conference with participation by state and interstate agencies and the alleged polluters, followed by recommendation by the Federal Water Pollution Control Administration to the state agency to take action within a period of not less than six months. Second, a formal hearing before a board appointed by the Administrator, and, after such hearing, again a direction that abatement measures be taken within a reasonable time of not less than six months. Finally, a discretionary request by the Administrator to the Attorney General to bring suit for an injunction on behalf of the United States.²⁴⁶ Some 43 informal conferences were held through 1968; only four continued to the hearing stage. Of these, only a single case was taken to court.²⁴⁷ Another provision allows compliance action by the Attorney General upon 180 days' notice to the polluter; no court action has as yet been taken under it.^{247a}

Both in air and water pollution enforcement, the federal government relies primarily on informal negotiations rather than on hard enforcement, for it is clear that the established enforcement devices do not meet the need for the swift and decisive action that may be necessary. Hence federal enforcement under both the air and water pollution control acts is only as effective as informal procedures prior to court action can make it. This is well in line with long accepted principles of public health compliance techniques which rely primarily on

education and on negotiated cooperative measures.²⁴⁸ It is clear, however, that these measures are not designed to gain compliance from a hard-core violator who sees no immediate reason for prompt compliance when it is costly and burdensome. Under both the federal air and water pollution control acts such a violator knows that he has two to three years from the time when the federal government commences its laborious proceedings until he may actually be compelled to take abatement measures. There is virtually no incentive for him to take earlier action, because neither the Air Quality Standards Act nor the Clean Water Restoration Act penalizes his delay--no fines or other sanctions are provided for dilatory action.

Oddly enough, it is older and far less sophisticated federal legislation that provides more immediate sanctions in the field of water pollution. Although the Rivers and Harbors Act of 1899 was not initially intended as a water pollution control measure, it has been increasingly used for this purpose through repeated interpretation and reinterpretation,²⁴⁹ and, although penalties under it are not very substantial, the Act does provide a far more immediate method of getting at industries that pollute navigable rivers and harbors and for criminal prosecution and maximum penalties of \$2,500.00.²⁵⁰ Recent federal enforcement activity, much of which has gleaned headlines considerably beyond its importance²⁵¹ has been based on Rivers and Harbors Act prosecutions which, though not a major deterrent to violators, provides a mechanism for prompt, direct action.

Of special note are efforts in areas of enforcement in which the federal government has asserted its preemptive interest. These areas are, notably, the area of automotive pollution by new cars and airport noise pollution.

Title II of the Air Quality Act of 1967 directed the Secretary of HEW to set national standards for emissions from new motor vehicles. Once such emission standards have been set, no manufacturer may produce for sale or for rental any vehicle which does not meet the standards. The law provides that the courts may by injunction stop any manufacturer from distributing motor vehicles which do not meet the federal emission standards and provides a fine of up to \$1000 per vehicle that exceeds the standards of emission.²⁵² The responsibilities of the Secretary have been transferred to the Administrator of the EPA.²⁵³

In spite of the law's apparent stringency, the present regulations fail to control the field effectively. First, the coverage of emission standards is less than complete. The Act applies to manufacturers that import vehicles into the United States, but vehicles imported for purposes other than sale or resale are not covered. This leaves uncovered the thousands of cars imported by individuals from abroad for their own personal use. Second, the method of seeking compliance with automotive emission standards for new vehicles does not assure that vehicles coming off the assembly line in fact meet national emission standards. Under § 2 of the Air Quality Standards Act, any automobile manufacturer may request the National

Air Pollution Control Administration to determine whether a particular new motor vehicle or new motor vehicle engine meets the applicable emission standards.²⁵⁴ If the test vehicle meets the standards, the Secretary of HEW must issue a certificate of conformity for a period of not less than one year. Thereupon any new motor vehicle or engine which "is in all material respects substantially the same construction as the test vehicle or engine for which a certificate has been issued,"²⁵⁵ is considered to have met the applicable emission standards. In consequence the thousand-dollar penalty per non-complying vehicle is totally meaningless, because a manufacturer whose prototype model has been certified is immune from the penalty, regardless of whether subsequent automobiles of the same model coming off the assembly line meet the emission standards in actual operation on the road. The evidence is clear that many of the automobiles that roll off the assembly line indeed do not perform as well as the certified prototype.²⁵⁶ It is also evident that emission control devices become less effective the longer the car stays on the road, so that by the time a vehicle has been driven for more than 20,000 miles, its emission control devices have generally lost most of their effectiveness.²⁵⁷ Thus, the inadequacy of enforcement of federal automotive emission standards appears clear. Moreover, they have exerted, through preemption, an inhibiting effect on state developments, (with the exception of California, whose standards antedate the federal ones).²⁵⁸ Since the federal government does not purport to exercise any control over older

vehicles, that area of enforcement has been relegated to the states to cope with as best they can under their various motor vehicle inspection laws.

Federal regulations with respect to aircraft noise appear to be preemptive in intent.²⁵⁹ While both the courts and the Federal Aviation Administration have asserted that operators of airports have the ultimate right to decide which aircraft can or cannot use their facilities as long as their judgment is not discriminatory, whatever decisional law there is seems to hold that local governments may not pass airport noise regulations or ordinances more stringent than the standards adopted by the FAA--though they may promulgate such standards in their proprietary capacity as airport operator.²⁶⁰ Thus, although there has been considerable dissatisfaction with the federal aircraft noise standards,²⁶¹ municipalities have been severely handicapped in defending their inhabitants against excessive noise from aircraft in interstate commerce. The suggestion is readily at hand that preemptive federal standards, both for automotive emissions and aircraft noise, are as much designed to protect the particular industries affected against more stringent controls by the states and municipalities as they are to protect the public.²⁶² This point may gain in force in light of recent federal participation in the development of the supersonic transport plane, for the regulation of sonic booms, it seems, is also a federal monopoly under the same legislation that authorizes FAA regulation of aircraft noise.²⁶³ Another example--which has since been resolved--is

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that of federal preemption under the Atomic Energy Act of 1946. Under that Act the federal government exercised broad and apparently wholly preemptive jurisdiction over all nuclear plants. The federal intent was, of course, to regulate all aspects of a nuclear installation in which there was a clear federal interest in the development of nuclear energy and in safeguarding a secret technology. A nuclear installation, however, also has ordinary boilers and a cafeteria and washrooms for its employees, as well as elevators in its office buildings. In the early days of the reactor industry, city boiler inspectors, city health inspectors, city elevator inspectors were refused access, on the alleged grounds that the plant as a whole was under federal regulation and that any regulatory effort by any other government was entirely outlawed. Clearly this had not been the federal intent, because the federal interest extended only to matters having a direct relationship to nuclear development. The federal legislation had not been intentionally designed to prevent normal city and state inspections of sanitary and safety features of nuclear installations that had no particular direct or indirect bearing on the nuclear installation itself.²⁶⁴ In spite of this, it was years before the issues were fully resolved in the course of the general revision of the Atomic Energy Act.²⁶⁵ That revision, of course, went far beyond the simple matter of permitting state and local health and safety inspectors to carry out their duties in parts of the installation that were not directly connected with nuclear development. Indeed, the

1959 revision of the Atomic Energy Act provides the basis for federal-state cooperation in the field. The role each state is to play in the partnership is to be fixed under the law by a formal agreement entered into between the state and the Atomic Energy Commission, and the precise range of state regulation is subject to that agreement.²⁶⁶ Although atomic energy legislation is no longer fully preemptive, the states clearly play the role of junior partners.

Difficulties created by partial federal preemption of a field are demonstrated too by the current state of the law with respect to the control of jet plane noise. The federal regulations set by FAA are preemptive in that no state or local government may set higher standards than the standards established by the federal agency. On the other hand, the federal agency has repeatedly stated that its regulations provide a minimum requirement only and that the proprietors and operators of airports throughout the nation are free to set standards of their own--i.e., each airport may decide that it will not permit its facilities to be used by planes that exceed a noise level set by that airport even though the level set by the airport itself may be higher than that set by FAA.²⁶⁷ In actual fact the purported permission to airports to set standards of their own is wholly illusory because, as a practical matter, airport operators cannot enforce higher standards. In this instance the federal standard is entirely more preemptive than it purports to be. The assertion that it is not wholly preemptive serves the purpose of the federal regulatory

agency, however, because whenever the federal standard comes under attack, the agency can respond that the local airport is free to require more stringent compliance if it wants to do so. Here, too, federal preemption has created a no-man's land in which there is federal abstention from standard-setting without any concomitant grant of power to the state or municipality to take up the slack.

*The Roles of the States and Municipalities
in the Enforcement and Administration
of Environmental Regulations*

AIR POLLUTION CONTROL

Regulations to control environmental pollution are generally enforced on the state or local level, if they are enforced at all. Whether particular enforcement efforts are the responsibility of a state agency or local agencies depends on the state's administrative or structural arrangements. In most states the agency primarily responsible for environmental controls is still the state health department.²⁶⁸ State health departments differ from state to state with respect to the degree of centralization and the degree of their interrelation with local health agencies. In some states the department operates primarily as a standard setting or rule making agency which may have advisory and other "staff" functions for the state as a whole, but which takes little or no "line" responsibility for the activities of individual municipal or county health departments. In many instances the supervision by the state health

agency of the activities of local or municipal health agencies is minimal indeed. The state health department does not supervise the day-to-day operations of local or municipal agencies, and may be called in only to take steps when some major failure on the part of municipal or local health agencies has occurred.²⁶⁹ In other states the responsibility for enforcement of health laws and regulations is much more centralized in the state health department, with county and municipal health agencies directly responsible for their routine performance, and accountable to the state health agency for all of their programs.²⁷⁰ In those instances a true "line" relationship exists between the local or municipal health agency and the state health department. A variety of more or less intermediate patterns exists, but in almost every instance the primary responsibility for standard setting and rule making is in the state health agency, and the actual enforcement function is lodged lower down in the hierarchy--whether or not the local agencies are directly responsible to the state agency or operate more or less independently from it.

The relationship of state health departments to county and municipal health departments is further affected by a variety of legal relationships dependent on the state constitution and on legislation that defines the relationship of counties and municipalities to the state generally. In many states, for instance, incorporated municipalities, such as villages and cities, will have health departments of their own, and in addition there will be a county health depart-

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ment which may or may not be an administrative branch of the state health department. This county health department will commonly have jurisdiction to operate within the unincorporated areas of the county, but each of the cities and villages will be free to regulate its own affairs, consistent, however, with whatever standards the state health agency may have prescribed for the state as a whole.²⁷¹ Moreover, the extent to which health departments in incorporated municipalities, such as villages and cities, may manage their own affairs may depend to a considerable extent on the degree of home rule granted to such municipalities, either by state constitution or general municipal legislation, or by their own individual charters. In terms of air pollution legislation, for instance, this means that there is likely to be a statewide air pollution control code²⁷² to meet the requirements of the 1967 Air Quality Standards Act for the air quality regions federally determined for that state. This statewide air pollution control act and the state code adopted pursuant to it indubitably set the minimum standard for the entire state. These standards are probably the only standards applicable to the unincorporated areas within the state. Additional requirements may have been set by a county air pollution control agency, and these standards, though consistent with the state code, may be higher for the county as a whole.²⁷³ The county standards, depending on some of the factors previously mentioned, may apply to the entire county or merely to its unincorporated areas--or it may apply to all of the

unincorporated areas in the county and to such of the incorporated areas, i.e., villages and cities, that have not adopted air pollution control codes of their own. Any major village or city, however, particularly if it has a substantial amount of industry, is likely to have an air pollution control code of its own which will have to be consistent with the county code, if any, and certainly with the state code. It may be more stringent than either one of them, particularly if it can be shown that the municipality has special problems of pollution caused by particular topographical or industrial features that are not shared by the rest of the county or state.²⁷⁴

The question raised by this array of overlapping, albeit supposedly consistent, codes is which agency enforces any one air pollution control code. As a rule of thumb it may be stated that each municipality or other jurisdictional entity enforces its own code, without much regard to the code of the next higher jurisdiction in the hierarchy.²⁷⁵ Each municipal air pollution control agency has a staff of air pollution inspectors and some monitoring or other surveillance equipment of its own, and each of these staffs and their equipment are used for the purpose of cutting down on emissions from within the jurisdiction so as to accomplish compliance with that jurisdiction's code. None of the municipalities have extraterritorial powers, and in practice, each jurisdiction can abate only the emissions emanating from sources of pollution within its own borders.²⁷⁶ Thus the air pollution inspector is stopped absolutely in his enforcement

efforts by the local boundary line. If City A has the most advanced air pollution control code but receives most of its pollution from industrial sources in City B located within the same county, the air pollution control inspectors of City A cannot enter City B to serve a violation notice on the industrial pollution source in B. Only the air pollution control inspectors in City B can do so.²⁷⁷ If the main consequence of emissions in B is pollution fallout in A, and if the source in B is a major employer of B's population, enforcement may not be overly zealous. There is also a question in many states whether the air pollution control inspector of the county in which both A and B are located can go into either of the cities to serve a violation notice because he, in turn, may be limited by provisions of law that grant enforcement powers within their own boundaries to incorporated municipalities. While air pollution is no respecter of jurisdictional boundaries, air pollution control agencies are, by reason of the law under which they operate. The consequence of jurisdictional limits on enforcement has frequently been to render helpless municipalities which themselves produce few emissions but which, by reason of topography or prevailing winds, receive all or most of the fallout from neighboring municipalities. There are even a number of instances on record when inventive owners of manufacturing establishments combined to incorporate industrial enclaves as cities or villages, as a defensive measure against the imposition of pollution controls.²⁷⁸ Thus a highly industrial area with a

daytime working population of several thousand persons and a nighttime population limited to a few watchmen may effectively eliminate the possibility of having environmental pollution controls enforced against them. All of the surrounding residential communities may enact the most sophisticated air pollution control ordinances, but since the source of emissions is in another incorporated area, the residential community's air pollution control codes will have little effect, because its air pollution control agency has no jurisdiction to enter the incorporated industrial area for purposes of enforcement. The only possibility to secure adequate enforcement under such circumstances is to grant enforcement powers for county and state agencies even within the incorporated areas. In the past, however, enforcement staffs have been lodged at the local level and in many states where the structure of health departments depended on local enforcement efforts, there was no effective enforcement staff on the state or county level. These structural hindrances to effective environmental controls are not the result of willful obtuseness on the part of state or local officials. When the business of health departments consisted primarily of epidemiologic controls or of controls of food establishments, eating places, barber shops, swimming pools, etc., the kind of division of labor between state, county and local departments involved here made good sense and was appropriate to the problems for which it was designed. It is only the realization that environmental problems have spread beyond narrow jurisdictional boundaries and affect

incorporated and unincorporated areas alike that makes much of the traditional governmental machinery for public health enforcement archaic and inappropriate for the uses to which it must be put.

WATER POLLUTION CONTROL

A somewhat different pattern of enforcement is encountered in the field of water pollution control. The municipalities generally are in charge of enforcing certain aspects of the purity of the water supply--i.e., it is generally the municipality's job, either under appropriate health code regulations or under subdivision ordinances, to see to it that necessary septic tanks and private sewage disposal systems are built and that they are built in a manner that will prevent pollution of well water and other sources of water supply.²⁷⁹ Normally, non-compliance is punishable as a misdemeanor,²⁸⁰ and usually the construction of a private sewage disposal system requires a permit from the local health agency with the frequent requirement that the system not be covered up or buried before a sanitary inspector has had an opportunity of checking it.²⁸¹ In addition, the municipality generally is in charge of enforcement against malfunctioning private sewage disposal systems and usually has the power of summary abatement if these systems develop into nuisances.²⁸² The municipality may have a requirement, too, that as soon as public sewers become available, the householder is under an obligation to connect his own facilities to the public sewer, paying whatever special assessments there may be for that service.²⁸³ In some instances,

SOLID WASTE DISPOSAL

With respect to solid waste disposal, enforcement is an entirely local matter. As has been pointed out previously, many states have extensive legislation dealing with the municipality's obligation to collect wastes and to dispose of them either by incineration or by sanitary landfill methods. Almost all municipalities have detailed regulations with respect to placement of wastes outside the home for collection and many of them go into significant detail with respect to the kind of containers that are permissible, where they may be placed and how soon they must be taken in after trash and other wastes have been picked up.³⁰² Violations of such laws and regulations are generally treated as minor misdemeanors, and the fines imposed are likely to be very low.³⁰³ Sanitary landfills, however, may be subject to a system of licensure in some jurisdictions.³⁰⁴ A number of municipalities have enacted some special legislation or regulations to deal with the ever-increasing problem of the thousands of old automobiles that are junked or abandoned at the roadside.³⁰⁵ Generally the trend of such legislation or regulation is to provide both penalties for unlawful abandonment of old cars and a service program to make it easier to leave old cars for sanitation department pick-up instead of abandoning them to become an eyesore and a possible hazard. Again, the responsibility for enforcement is generally that of the municipality, which is handicapped in applying the criminal sanctions because the ownership of abandoned cars is

usually very difficult to trace after the license plates have been removed.³⁰⁵

NOISE POLLUTION CONTROL

Enforcement of noise control, traditionally a matter of local concern, generally involves police prosecution, with minor criminal penalties.³⁰⁷ The states, however, have long exercised jurisdiction over industrial noise through their industrial codes administered by the state labor department. Criminal penalties for violations, as well as cease and desist orders and injunctive relief are commonly available; administrative procedures before the state labor department usually precede prosecutive and other judicial remedies.³⁰⁸ With the greater concern for automobile noise, state muffler legislation has become almost universal, and violations are commonly punishable as misdemeanors.³⁰⁹ In addition, such legislation is also enforced through state motor vehicle inspection laws.³¹⁰

RADIATION CONTROLS

A particularly diversified pattern of state and local enforcement is encountered in the area of radiation pollution. Although radiation standards are primarily set at the federal level--and even in instances where they may be set at the state or local level they will commonly follow the federal pattern--the enforcement of radiation protection standards is presently dispersed among a variety of federal, state and local agencies. The enforcement of standards, both within reactor installations and outside of such installations,

is entirely subject to Environmental Protection Agency supervision, as successor, under the 1970 Reorganization Act, to the Atomic Energy Commission. The disposal and storage of atomic wastes, however, remains an AEC responsibility.³¹¹ As previously indicated, however, under the 1959 amendments to the Atomic Energy Act, the states were invited to make agreements with the Atomic Energy Commission to arrange for the assumption of responsibilities for the development of nuclear power and particularly for radiation safety within the state.³¹² State regulations and state involvement in the enforcement of radiation protection measures vary considerably in scope and detail. There are a few states that have no legislation on the subject at all,³¹³ but most have at least a provision requiring nuclear materials to be registered.³¹⁴ A number of states have rather elaborate registration and licensing provisions³¹⁵ and some share regulatory burdens with municipal governments within the state.³¹⁶ One of the most sophisticated systems is that of the State of New York which will be used to illustrate the various interests and agency involvements that may be encountered in this rather complicated field.

Both the State and the City of New York have comprehensive radiation protection codes to protect against overexposure to ionizing radiation, whether from isotopes or from X-ray machinery. The state code is a part of the State Sanitary Code promulgated by the State Public Health Council pursuant to the State Public Health Law.³¹⁷ It applies throughout the

state except in New York City. The City's radiation code is part of the New York City Health Code, promulgated by the City Board of Health, under the New York City Charter.³¹⁸ Both codes contain elaborate administrative provisions for permits for holders of certain radioactive materials, and for the registration of the materials themselves. Both codes, moreover, prohibit the use of X-ray equipment by persons who are not licensed in the healing arts, or persons under their supervision. The sale or rental of X-ray equipment to persons not authorized to use it is also prohibited. The State Public Health Law itself, in fact, regulates the practice of X-ray technology.³¹⁹

Both the State Sanitary Code and the New York City Health Code expressly limit themselves to the regulation of emissions of radiation not otherwise regulated by the Atomic Energy Commission, or by the State Industrial Code. The federal government retains exclusive power over emissions from nuclear reactors, and the disposal of radioactive wastes.³²⁰ The State Labor Department, under the Industrial Code, regulates the use of radioactive substances and equipment in its industrial applications.³²¹ Again, a detailed administrative permit and regulation requirements are provided for. In addition to administrative remedies of permit revocation, hearings and cease and desist orders, violations of each of the respective codes are also punishable as misdemeanors.³²²

The New York City Health Code also regulates the transportation of radioactive materials within the City.³²³ Shipments of nuclear materials are under

the jurisdiction of the Atomic Energy Commission, but as a matter of comity the Commission provides the City with reports of all of its major movements of such materials within and through the City.³²⁴

While the State and City radiation codes do not contain any such express provision, because reactor uses are regulated by the Atomic Energy Commission while industrial uses are controlled by the State Labor Department, the enforcement and regulatory activities of the state and city health departments are primarily concerned with medical uses of ionizing radiation.

Intergovernmental Cooperation—the Use of Interstate Compacts

There has been relatively little intergovernmental cooperation in the area of environmental regulation or enforcement. In the main the intergovernmental cooperation has involved cooperation imposed from the top down, rather than among governments at the same level. In a sense one may view the arrangements under the 1967 Air Quality Standards Act and in the 1966 Water Restoration Act as examples of intergovernmental cooperation, because in both instances the federal government sets requirements and requests the states to meet them, keeping in reserve the federal power to impose standards if the particular states involved do not undertake to do so on their own.³²⁵ So, too, the various grant-in-aid arrangements for the construction and maintenance of sewage treatment plants and water purification installations are instances of intergovern-

mental cooperation, in that the federal government and the states or the localities cooperate in their establishment.³²⁶ Another instance of intergovernmental cooperation can be discerned in the field of atomic energy where the states and localities have taken over some aspects of radiation safety control under contractual arrangements.³²⁷ What is true of all these apparent instances of cooperation is that they are not freely entered into by all of the participants. In every instance the cooperation is either enforced by the federal government, or, in the case of arrangements under grants-in-aid, operates on the terms set by federal law or regulation. There are, to be sure, some instances of interlocal cooperation, particularly in the area of water management and sewage disposal. In those areas a number of states have authorized the establishment of water districts or sewage districts which exceed the territorial limitations of any one of the localities within them.³²⁸ Such water or sewage districts are generally regarded as municipal corporations established for a special purpose; they normally assume some of the powers of the local governments included within them and may have limited taxing or other revenue powers in order to carry out their assigned tasks.³²⁹ Normally, however, arrangements for such special purpose authorities or districts are made cooperatively after voter approval by the different localities and governments involved. The municipalities located within such a district generally cede or delegate to the district the particular

municipal powers involved or at least abstain from exercising those powers after the special-purpose district becomes operative.³³⁰

In the conservation field, too, special authorities or park districts have been created in a number of states, again exercising powers for conservation and recreation purposes that would otherwise be exercised by the municipalities affected.³³¹ However, in the instance of such recreation, park or conservation facilities, the establishment of the agency is normally the result of state action and not the result of co-operative planning on the part of the municipalities or local governments involved.

Over the years a number of schemes have been proposed to provide a framework for cooperation of the numerous municipal governments that usually compose the total area of a metropolitan region.³³² These schemes, intended to provide for more effective metropolitan planning and to cut down on the inefficiencies and overlaps of governmental efforts within metropolitan regions, are not primarily designed for cooperative arrangements to regulate environmental pollution, but since a substantial part of the business of government in metropolitan areas is concerned with the environment, they would have an obvious impact on environmental controls. Particularly schemes such as annexation of unincorporated areas abutting on the central city, city-county consolidation or metropolitan combinations of government would have an obvious impact on the enforcement of air pollution, water pollution, noise and other environmental regulations,

and on the rendition of services to improve the city environment. The history of these devices has been most disappointing, and few metropolitan areas in the country can point to successful forms of metropolitan government combinations. One which has been recurrently advocated is that of the formation of a metropolitan government council with representatives from all of the local governments that make up the metropolitan region represented. Such a metropolitan government council serves essentially as an organization for liaison, coordination, mutual information and advice. It has proved to be acceptable to a number of metropolitan areas simply because it is entirely advisory and makes and enforces no decisions.³³³ Its uses in connection with the management of environmental pollution are difficult to document, though it is clear that such a council could serve as a ready forum, for instance, to bring to the attention of the representative of each municipality in the region that its air pollution emissions were causing a problem in another municipality within the same metropolitan area. Whether or not this will ultimately help to resolve the problem is a different question. On the whole, experience with advisory and coordinating bodies that are free to inform but have no power to decide or enforce has not been very impressive.

Perhaps the only device for intergovernmental cooperation which has had some experience behind it and has some possible uses before it, is the interstate compact. Originating during colonial times as a

device to settle boundary disputes, the interstate compact has long been recognized as a proper method for the exercise of state power and, more recently, even of federal legislative power in any area in which Congress has the authority to act.³³⁴ The Supreme Court has expressly recognized the validity of the interstate compact in the exercise of the power to "promote the general welfare through large-scale projects for reclamation, irrigation, or other internal improvement..."³³⁵ The constitutional basis is found in the compact clause of the Constitution, which allows the states to enter into such agreement with congressional consent.³³⁶

Before 1920 interstate compacts had generally been used only for the settlement of boundary and other disputes between contending states, and did not involve the creation of agencies authorized to carry on governmental functions for an unlimited period of time on behalf of the states involved.³³⁷ In the 1920's, the New York Port Authority, which has since become one of the most powerful interstate compact agencies, was established by a compact between New York and New Jersey.³³⁸ At the same time, the western states joined to form the Colorado River Compact,³³⁹ which established a commission to allocate the waters of the Colorado River. These two compacts opened the way to a consideration of the utility of the compact device to carry on a variety of governmental functions over an extended period of time.

Since the early interstate compacts had established compact agencies with delegated powers over river and

harbor management, it is not surprising that they soon were thought of in connection with water pollution control. The first such compact was joined in 1935 by New York, New Jersey and Connecticut. Known as the Tri-State Compact, it created a permanent agency, the Interstate Sanitation Commission.³⁴⁰ The initial purposes of the compact were relatively limited--it dealt primarily with coastal, estuarial and tidal waters and was primarily concerned with the protection of fish and shellfish against contamination by sewage and other effluents. The Commission consists of 15 commissioners, five of whom are appointed by the governor of each of the three states. All decisions of the Commission require the concurrence of three of the five commissioners from each state. The Commission sets water standards and is empowered to issue abatement orders which are enforceable in the courts of each of the member states. Because it has both standard setting and enforcement functions, the Commission is considered to be relatively powerful.

The compact commission created in 1940 under the Potomac River Compact between Maryland, West Virginia, Pennsylvania, Virginia and the District of Columbia, demonstrates an entirely different pattern.³⁴¹ Though the Commission includes federal representatives for the District of Columbia, appointed by the President, it has no rule-making or enforcement powers--its functions consist purely of research and advice to the member states. A new and stronger compact for the Potomac River with effective enforcement powers is presently pending.³⁴²

Another variety of regulatory compact is illustrated by the New England Interstate Water Pollution Control Compact which was approved in 1947 by New York and the New England States.³⁴³ Under that compact the Commission is authorized to adopt standards, but the enforcement of the standards is left entirely to the seven member states. The Commission itself has neither investigatory nor enforcement powers.

A compact agency with substantial powers has been established under the Ohio River Valley Water Sanitation Compact, ORSANCO.³⁴⁴ This compact was approved by the states of Illinois, Indiana, Kentucky, New York, Ohio, Pennsylvania, Tennessee and West Virginia in 1940, but did not go into effect until 1948. The ORSANCO Commission has standard setting as well as enforcement powers; however, its scope and enforcement is somewhat limited by the fact that any determination of the Commission must be approved by a majority of the commissioners from a majority of the member states, as well as by a majority of the commissioners from the states affected by the determination or order.

The two commissions with substantial enforcement powers, namely, the Interstate Sanitation Commission and ORSANCO, have both issued a number of compliance orders, but only the Interstate Sanitation Commission has thus far sought enforcement of its orders in the courts. It has generally succeeded in having its orders upheld.³⁴⁵

In addition to the compacts that deal specifically with the control of water pollution, a number of other water compacts affect water pollution problems

incidentally. In some of them, while pollution control is mentioned, the major purpose of the compact is a different one, be it water allocation, flood control, recreation or soil conservation. One other major and perhaps the most comprehensive interstate compact in the water regulation field is the 1961 Delaware River Basin Compact between Pennsylvania, New York, New Jersey, Delaware and the national government.³⁴⁶ This compact is unique in that the federal government is a full party to the Compact and is a full member of the compact commission. The compact is also unique in that it is concerned not with isolated phases of river basin management, but with all aspects of the development of the Delaware River basin. Among its many powers are the power to regulate water allocation and use in the basin, to make provisions, and to take preventive measures, for flood control, to develop recreational uses of the river, to develop the river for hydroelectric power purposes and to set and enforce water pollution standards. A compact of somewhat similar jurisdictional reach has been proposed for the Susquehanna River basin. Passed in New York and Maryland, that compact is still pending in Pennsylvania.³⁴⁷

The development of the compact device in the field of air pollution control has been much less advanced than in water pollution control. Although interstate cooperation in the field of air pollution control has been encouraged in federal legislation ever since the first federal Air Pollution Control Act in 1955, no air pollution control compacts are presently in effect.

The only and somewhat inconsequential exception is the New York-New Jersey-Connecticut Interstate Sanitation Commission which, by amendment of the water pollution compact, was given some limited authority over tri-state air pollution as well.³⁴⁸ In the air pollution field, however, its jurisdiction is merely advisory and has been of little effect. While federal legislation purports to encourage the use of the interstate compact device for air pollution control,³⁴⁹ the federal legislation in other respects has served to inhibit rather than advance such compacts. At present three major air pollution control compacts, the Ohio-West Virginia Control Compact,³⁵⁰ the Indiana-Illinois Air Pollution Control Compact,³⁵¹ and the Mid-Atlantic States Air Pollution Control Compact,³⁵² are pending before Congress. In addition, a fourth, rather far-reaching compact has been proposed and is presently pending in a number of states.³⁵³

It is unlikely that any one of them will obtain the necessary federal consent. All of the three proposed interstate compacts were pending when the 1967 Air Quality Act became law. In the course of passage of the Act, a House amendment was proposed to delete the provision of the Clean Air Act encouraging states to enter into air pollution control compacts. This provision was restored in conference between the House and the Senate,³⁵⁴ but with a most important caveat, stating the intent of Congress that no future air pollution control compact would be approved if its jurisdiction encompassed an air quality control region including any state not included in whole or in part

in the designated region.³⁵⁵ Subsequent steps in the passage of the law provide a guide to its interpretation. The Senate Judiciary Committee, which has jurisdiction over compact approval, referred the three compacts to the Subcommittee on Air and Water Pollution of the Committee on Public Works because of its special familiarity with the subject matter. In a statement and testimony on behalf of the Department of Health, Education, and Welfare on March 26, 1968,³⁵⁶ and in the Public Works Committee's report back to the Judiciary Committee,³⁵⁷ interstate compacts were again endorsed as desirable ways of carrying out the policies of the Air Quality Act. However, the Act was construed as providing some rather specific limitations on compact activity. The Department found the three compacts unacceptable as submitted, largely because of their alleged incompatibility with the Air Quality Act.³⁵⁸ The Subcommittee concurred in substantially all of the Department's objections. The Committee report recommends that Congress approve the compacts on condition that the states enact appropriate amendments.³⁵⁹

A number of the objections made were based on general considerations of effective air quality control enforcement. For example, it was stated that the enforcement agency under the proposed compacts should have the full range of powers--which it did not--including the right to obtain injunctions against violations, and that pollution should be defined so as to reach potential as well as presently injurious effects. Other objections reflected the usual Congressional reluctance to commit itself to a greater

extent than necessary. The reservations preserve national emergency powers, insure Congress' right to alter or amend its grant of consent, and provide that consent to any compact does not represent a determination that the compact agency necessarily qualifies under the Air Quality Standards Act.³⁶⁰

None of these objections would pose significant obstacles in the case of a well-designed compact. In certain other respects, however, the Act, as interpreted by the Department and the Committee, imposes major constraints on compact structure. These relate chiefly to two matters. The first arises from the statutory provision noted above, i.e., that no compact which relates to control of air pollution in an air quality control region may provide for participation by states not included in whole or in part in such region. The Department views this as an absolute requirement, and also adds the converse requirement that an interstate compact must include all the states with territory included in the air quality region.³⁶¹ Although the Act does not further state that the specific territory governed by a compact must consist solely or primarily of the designated region, both the Department and the House Committee on Interstate and Foreign Commerce (which added to the Act the language containing the limitation on compact membership) have indicated that compacts should ordinarily only cover specific metropolitan areas or groups of closely related communities which share a truly common air pollution problem.³⁶² The total effect of this interpretation rejects an arrangement like the Mid-Atlantic

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compact which was designed to cover several entire states and to include two massive air pollution problem areas, New York and Philadelphia. Thus federal policy will bar virtually any air pollution control compact which goes substantially beyond the boundaries of a single air quality control region.

The second major effect of the Act on future compacts arises from the Department's insistence on separating the compact agency from any official tie with the federal government. The Act, technically speaking, imposes the duties of adopting and enforcing air quality standards on the states themselves. The Department of Health, Education, and Welfare is prepared to view an interstate compact agency as being the arm of the states for purposes of compliance with the Act, subject to certain requirements as to the nature of the compact as follows:

- a. The federal government is not to have voting membership in any compact. The Department deems this as a conflict of interest with its duty to pass on the adequacy, under the Air Quality Act, of the standards that the compact commission will issue. Non-voting federal representation, however, is considered highly desirable.
- b. The compact agency is to be an agency or instrumentality solely of the states, rather than of the states and the federal government.
- c. Despite the compact's possible status as federal as well as state law,³⁶³ standards and rules under the compact would only have the status of enactments of the state, not of the federal government.

The principal practical effect of such a characterization is that the compact standards generally would not be binding on the agencies and operations of the federal government.

- d. Finally, since the compact machinery would be solely the creature of the states, the federal government would not share in financing its operations as a party to the compact. Federal support of the operations of the compact commission would come solely through the grant-in-aid programs authorized under the Air Quality Act.³⁶⁴

It is perhaps worth noting that virtually all of these issues had been present when the Delaware River Basin Compact was before Congress, and at that time Congress saw fit not only to consent--but to consent to full federal participation as a contracting party.³⁶⁵

Since the appropriate Senate committees have made their recommendations, the Ohio-West Virginia compact has been revised and the revisions approved by the West Virginia legislature.³⁶⁶ The revision, however, is still pending in Ohio.

The draft of the fourth proposed compact, the Penjerdel compact for the Pennsylvania-New Jersey-Delaware region, which includes the Philadelphia-Camden-Wilmington area, was undertaken with the criticisms of earlier air pollution control compacts in mind, and there is thus a possibility that once passed by the states, it may find Congressional favor. The supporting materials for the proposal contain a great deal of detailed and reasoned support for air pollution control compacts with broad regulatory powers. In

supporting the compact the agencies involved in its preparation examined other alternatives to regional air pollution control management and concluded that--short of federal regional air pollution control--the interstate compact furnished the only viable possibility for true regional air quality management.³⁶⁷

The Penjerdel compact, going even beyond the proposed Mid-Atlantic Air Pollution Control Compact, projected a "coordinated regional program of continuing action--planning, monitoring, research, informing and persuading, rule making, enforcement--not just coordinating law making at the outset."³⁶⁸ It proposed the establishment of an interstate compact agency with extensive enforcement powers of its own, and with staff and enforcement personnel separate and distinct from that of the participating states. It did, however, anticipate that in many instances enforcement would be undertaken with the cooperation and the assistance of personnel of the member states. It concluded that other devices, such as uniform legislation or the use of special authorities or districts would be inadequate to cope with the "fragmented and grossly inadequate"³⁶⁹ effort to manage and control the particular region's atmosphere, and that an interstate compact was the only device capable of overcoming the jurisdictional deficiencies caused by the mosaic of state and local political boundaries dividing a geographically related and economically interdependent region with air pollution problems.

While the interstate compact device, properly managed, has indisputable potential as a tool for

regional air quality management, interstate compacts have been subjected to a number of criticisms. The establishment of an interstate compact is a lengthy procedure. It has taken an average of eight years and nine months from the time a compact is proposed to the time Congressional consent was obtained.³⁷⁰ The compact is thus clearly not a device to deal with emergency situations. In addition to the ponderous machinery necessary to enter into a compact, some of the compact agencies have been no less ponderous in their actual operations. Since they are not normally responsible to any particular constituency, the main difficulty with compact agencies is their lack of responsiveness to public needs. They have often been charged with delays in decision making caused by commissioners who, frequently regarding themselves as ambassadors from their own states, seek instructions before they will join in decision making. It has also been said that compact procedures themselves delay decision making. Although compact agencies are generally designed to operate by majority vote, they will commonly tend to rely on unanimity. Decisions of compact agencies may, therefore, be geared to the lowest level of agreement, i.e., that level which the least developed member state can agree to.³⁷¹ Moreover, there is an inevitable tendency to logrolling between commission members with a tendency to agree to vote for one state's project in return for a promise to vote for the other state's project. Interstate compacts may also be hampered in their work because Commissioners will

often primarily be concerned with the protection of the parochial interests of their own state rather than with the interest of the region as a whole.³⁷² Another criticism which is perhaps less valid today than it used to be in the past is that of inadequate representation of the national interest in compact agencies. Today a representative of the federal government is likely to participate either as a member or as an observer of a compact commission. Moreover, interstate compact agencies, to the same extent as the states themselves, are dependent on the federal government for a great deal of the support of their activities. Indeed, the 1967 Air Quality Act encourages and provides financial incentives for the use of interstate mechanisms, including interstate compacts. There is, in consequence, adequate provision for federal oversight of compact activities. Finally, the compact has been criticized as non-representative in that it lacks a constituency and gives an equal voice to every member state, regardless of size and degree of interest.³⁷³

The interstate compact device, in spite of the criticisms that have been leveled against it, is the only workable device for regional pollution control management short of general federal controls. In view of the unwillingness both on the part of the federal government to assume, and on the part of the states to surrender, wholesale responsibility for pollution control, efforts should be directed to devising interstate compact mechanisms that will meet the criticisms and that will enable interstate compact agencies to function free from the obstacles

that the configuration of particular compacts has frequently imposed on such agencies in the past.

Problems Presented by Present Legal and Administrative Arrangements—A Critical Recapitulation

As indicated by the previous review of environmental legislation, one of the major problems that the present pattern of rule making and enforcement in environmental law presents to effective environmental management is the lack of a unified policy and the disjunctiveness of regulatory and enforcement activities. This lack of integration and disjunctiveness is two-fold. First, there is no integrative principle that in some way ties federal and state development programs into the state and federal environmental control effort. Second, present legislation too often separates the responsibility for rule making and standard setting from the responsibility for enforcement by lodging them at different levels of government. Although there may be adequate reasons for the division of labor, it frequently renders the regulatory effort less effective.

The earlier portion of this paper dealt primarily with specific regulatory efforts in the control of pollution. But as previously noted, when discussing the lack of integration of policy between development programs and the programs of pollution control, we must consider governmental involvement more broadly. So, for instance, the federal and state highway program has a most significant environmental impact

which heretofore either has been disregarded or dealt with in a manner wholly separate and unrelated to programs to regulate environmental pollution. The highway program--aside from possible damage to scenic, historic and aesthetic values--has major ecologic effects in that it may interfere with watershed management, and may adversely affect forests, wildlife and other resources deserving of protection. Just as important as any of these, it may have a major impact on the spread of air pollution from automotive sources. The federal government's support of extensive road-building programs³⁷⁴ constitutes federal support for internal combustion engines, by encouraging greater use of private automobiles and refined fuels, and in consequence, of automotive air pollution and other environmental effects that stem from fuel refining operations. The production of more automobiles in and of itself makes considerable demands on power resources which in turn require industrial and combustion processes with broad environmental implications. Without entering into any detailed discussion of the social and economic implications of federal road building programs, and even on the basis of a very cursory overview, it is apparent that to consider federal regulatory activities that deal with air pollution, water pollution, and other major environmental pollutants without reference to the federal government's own activities that have a direct or indirect impact on the environment is to tell less than the full story. Thus, federal controls on automotive pollution may be largely neutralized. The present policy preference for road-building over development of means of mass transpor-

tation is, thus, a policy which has to be considered as part of the air pollution control picture, as well as, of course, a matter having huge planning, land use, and urban developmental implications.

Numerous other examples of disjunctiveness in policy-making could be provided from present federally-supported programs. One of them is the atomic energy program. The Atomic Energy Commission has not only been given regulatory powers over the use and development of atomic energy, but also has the affirmative obligation to encourage and develop nuclear power sources.³⁷⁵ Leaving aside the question of disposal of nuclear wastes, which has in and of itself become a major environmental problem, there is no indication that environmental values were considered when the Atomic Energy Commission received as part of its charter the task of helping to develop nuclear power plants. Nuclear power plants share with fossil fuel power plants the problem of thermal pollution resulting from the use of river water as a coolant. Nonetheless, even at the present, relatively advanced state of technology there is clear evidence that nuclear power plants produce a great deal more thermal pollution than conventional ones.³⁷⁶ In addition, in the early phases of nuclear power, not enough consideration was given to the question of the cumulative effects of even the low permissible emissions of a radioactive nature from nuclear power plants.³⁷⁷ Clearly the needs for power are so great that some price must be paid for its availability in terms of adverse environmental consequences. The purpose here

is not to say that such adverse consequences must be avoided at all costs, but simply to point out that there ought to be coherence in the policy-making process between the promotion of new government-sponsored projects and the agencies of government that are charged with the protection of the environment against known hazards.

Numerous other examples of this kind of disjunctiveness in policy-making could be cited. Some of them have been the subject of caricature for a long time. So, for instance, the efforts of the Corps of Engineers at land reclamation could be juxtaposed with the concern of the Department of Interior for wetlands preservation.³⁷⁸ Another instance was the effort of the Department of Agriculture to advance the use of agricultural insecticides and fertilizers without regard to the Department of Interior's efforts at water pollution control; many of the fertilizers advocated create precisely the kind of runoff which contributes to the eutrophication of the rivers.³⁷⁹ Another instance was the schizophrenic nature of the Department of Interior's own activities--which, by the way, are shared by many of the states' departments of conservation and resources. On the one hand, the department was charged with development functions involving the improved exploitation of resources, particularly in mining operations. On the other hand, many of these mining operations result in the production of tailings and the destruction of the topography in such a manner as to contribute greatly to the pollution of the rivers which the Department

of the Interior was also charged with cleaning up.³⁸⁰ With the creation of the Environmental Quality Council in 1969 and the transfer, in 1970, of the environmental aspects of these functions of the Departments of Agriculture, Defense, Interior and the Atomic Energy Commission to the Environmental Protection Agency, first steps have been taken to eliminate disjunctiveness between development programs and environmental protection on the federal level.

As to the second aspect of disjunctiveness in environmental policies and programs, it is clear that the dispersal of responsibility among federal, state and local agencies frequently creates confusion and results in ineffective enforcement. A review of the situation in the field of air pollution control provides a focus for our discussion. While clearly air pollution is a regional problem in its impact and the development of regulatory policies and actual standard setting functions is moving toward the federal government, as we have seen, all of the effective regulatory controls remain lodged on the local level.³⁸¹ The federal government still is responsible only for approving regional air quality standards (except in the case of emissions from new automobiles where some federal emission standards have been set). While all of the states have by now enacted state air pollution control codes that set limits on the emission of air pollutants in order to live up to federal standards for the ambient air, it is clear that no fixed formula determines the relationship of emission standards to ambient air quality standards, and the presence of

federal air quality standards does not by itself impose upon any state the obligation to reduce emissions from particular sources. Legislative developments already point to the eventual adoption of federal emission standards, possibly national and most certainly regional in scope. But even with adequate federal and state emission standards, enforcement is likely to remain at the municipal level. As pointed out earlier, enforcement is limited by the geographical boundaries of the jurisdiction. Since effective air pollution control must take place at the source of emissions, the jurisdiction which receives the fallout and which suffers the consequences of the emissions is frequently not the one which can regulate the source. In view of the fact that most municipal or other local enforcement agencies operate independently of the state air pollution control agency, enforcement is likely to be very spotty indeed. Moreover, though the standards may be relatively high, having been set at the state level, enforcement at the local level may reflect a response to political pressures which were not present to the same extent at the level at which the policies were first adopted. Thus, though the federal government or the state may limit particular emissions stringently, local enforcement is likely to be lagging when the enforcement effort would result in limiting the activities of a major employer in the locality.

Present arrangements for policy-making are thus in need of substantial review with a view to restructuring environmental programs on a national or at

least regional level. Enforcement activities are similarly in need of review. Traditionally, much of the environmental enforcement effort has been lodged at the local level. Recently legislative developments have begun to place policy-making and standard-setting at higher levels of government, reflecting the insight that effective standards and policies for environmental control cannot be limited within narrow jurisdictional boundaries. The question arises whether what is true of policy-making and standard-setting is not also true of enforcement. Can we rely on the local jurisdiction to enforce the state, regional or national standard if the impact of stringent enforcement will fall primarily on industrial and commercial establishments within the local municipality? While a national air pollution control program would be difficult to operate with thousands of air pollution control inspectors and other enforcement personnel responsible to the National Air Pollution Control Administration in Washington, D.C., new instrumentalities and new enforcement devices should be considered to overcome the constraints that local administration puts on effective enforcement.

A major part of the difficulties in the regulation of environmental pollution is posed by the persistent attempt to deal with regional and national problems on a state or local level, in spite of the fact that problems of environmental pollution have outgrown the limits of the state or local police power. The insight that environmental pollution is increasingly a regional if not a national or even international

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problem is very recent, and our traditional institutions and modes of dealing with it reflect a cultural lag. It is important to remember that less than ten years ago air pollution could still be regarded as a primarily local problem, and that it has been a mere fifteen years since the federal government has involved itself in the regulation of water pollution. Originally the dimension of these problems was such that they could be regarded as local in nature, but air pollution and water pollution are no longer local or even state problems; they have become national problems quite simply because the amount of pollution and the adverse environmental effects have become so great as to burst beyond the boundaries of narrow local jurisdictions. They have simply become too great for municipalities and states to handle on their own. The process is still going on--initially local problems still grow into matters of national concern in environmental pollution. The solid waste disposal problem is an example. Still treated as a primarily local matter, it is becoming more apparent every day that no major municipality has enough land to bury its waste or the facilities to incinerate it without creating major water or air pollution problems that will spill over municipal--and state--boundary lines. Another example is that of noise. Though noise is relatively limited in its range, many sources of noise, such as jet aircraft (not to speak of the proposed supersonic transport), cannot be regulated locally but are by their very nature subject to national controls. And even when noise is more locally defined--as in the

case of more insulation of residences--unequal local requirements create competitive disadvantages for the localities that impose the higher standards.

The persistence of the belief that problems of environmental pollution that are regional and national in their impact can somehow be handled on the local or municipal level continues to have adverse consequences on the effectiveness of regulation. It has been demonstrated that the territorial jurisdiction of many municipalities and local governments--and even the territorial jurisdiction of many states--is inadequate to cope with problems of regional air or water pollution. Within metropolitan areas, in particular, the source of emission and the place of fallout are likely to be under different governments. Since local governments have no extraterritorial powers and since state governments rarely intervene in local intergovernmental disputes--particularly where the dispute has its origins in the activities of a private operator--there is frequently no agency that is responsible for abatement. What holds true of different municipalities within one metropolitan area also holds true of interstate regions. When the source of emissions is in one state and the impact is in another, the only available remedies are either federal or else, far less frequently, remedies provided under some interstate compact. The only other remedy, an original suit in the United States Supreme Court is even less frequently invoked.³⁸² Thus far the federal government has exercised its enforcement powers with

great restraint--rarely, and only after lengthy delays, and in emergency situations.

In addition to weaknesses in enforcement caused by limited territorial jurisdiction, disabilities have also been caused by inadequate legal power. This is particularly true of powers granted to local and municipal governments. The powers of municipal government under state constitutional or state legislative provisions are often narrowly circumscribed.³⁸³ Even in instances where a municipality has been granted home rule status, the question whether it may carry out particular functions is often unclear, especially when the state has already asserted a regulatory interest by enacting general legislation.³⁸⁴ Assuming that the municipality's power to exercise a power on its own is clear, the question of consistency of the local and state code still remains, and unless the local code merely duplicates the state code, there will always be a question whether a different regulatory approach is consistent or inconsistent with the state regulations. When the state merely regulates emissions, may the municipality add fuel regulations, or would such fuel regulations be considered inconsistent with the state action? There simply is no clear answer.

Problems of consistency aside, local governments are commonly granted more limited powers of enforcement than state governments. Most of the state codes are presently enforceable by a variety of criminal, and civil (including administrative and equitable) sanctions. On the local level, however, enforcement

is likely to be by criminal prosecution as for a misdemeanor, and the use of civil penalties or equity proceedings is either not authorized at all, or else is only rarely invoked. The limits of the criminal process for effective environmental enforcement have been discussed elsewhere.³⁸⁵ In view of the relative ineffectiveness of the criminal process to bring about improvements or abatement of conditions, a municipality that can do no more than to prosecute an environmental offender is severely handicapped in its efforts.

In a few areas the federal government has seized hold with full vigor and has claimed preemptive effect for its laws and regulations. While federal preemption may be necessary in some areas, it may also create problems of its own, as, for example, in the area of control of airplane noise and atomic energy. Essentially, federal preemption has tended to create a jurisdictional no man's land where state and localities fear to tread though full regulatory jurisdiction has not been expressly exercised. Federal preemption, both with respect to regulation and enforcement, is clearly called for in many areas of environmental control--when national uniformity is essential by the nature of the problem, or the consideration of regulatory efficiency proves persuasive. The arguments for federal preemption, however, need to be examined and clearly articulated in every instance. When a decision is made to use federal power preemptively, it should be made wholeheartedly, to cover the field clearly and decisively in order to avoid the peripheral jurisdictional uncertainties.

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The federal government could, constitutionally, assume control of the regulation of all environmental pollution, and it could establish broad interstate regions to carry out its regulatory activities, but it is unlikely to do so both for political reasons and for reasons of administrative economy. Short of such federal assumption of power, the only viable mechanism for regional pollution control management is the interstate compact. As has previously been indicated, although the interstate compact has not been used to full effect in the regulation of environmental pollution, it appears to be an instrument of considerable flexibility and potential. There are a number of problems with the interstate compact device which will need to be resolved, however, before its full potential may be realized. Considerable attention should be given, first, to redefining the appropriate federal role in such an interstate arrangement. With the dominant federal interest in navigable waters (and, therefore, indirectly in all waters), interstate compacts affecting waterways have invariably had federal representatives, observers, or participants on the regulatory commission.³⁸⁶ With the exception of the Delaware River Basin Compact, however, interstate compacts have not enjoyed direct federal participation, and the federal government has thus far not seen fit to exercise federal power through interstate compact agencies. The possibility that the federal government might well use interstate compact agencies as executors of federal policy was contemplated and accepted in the promulgation of the Delaware Compact.³⁸⁷ In order to make the interstate

compact device more effective and less likely to conflict with closely related federal interests, the possibility of working out similar relationships in other water pollution compacts, as well as in air pollution control compacts that have been proposed, ought to be considered.

One of the major obstacles to full federal participation, and to the use of interstate compacts as carriers of federal policy, is the concept of "equal sovereignty" which has inhibited the use of compacts as effective institutions. The problem is not an easy one. Theoretically, there is ready acceptance of the notion that in a compact like the Delaware Compact the interests of the State of New York are considerably more extensive than the interests of the State of Delaware, in terms of population served, industrial development, use of the river basin, and capacity to contribute financially to the development of the basin and to the operation of the interstate compact agency. On the other hand, there is a political and constitutional tradition that each of the states is an entity of equal sovereignty. In any interstate compact, therefore, all of the states ought to be regarded as sovereign equals, just as are parties to a treaty. The equal sovereignty concept has given far greater influence to the smaller states, and has sometimes put the larger state at the mercy of a combination of the smaller states who are members of the compact, because traditionally each state has equal representation on interstate compact commissions.³⁸⁸

The equal sovereignty problem aggravates the difficulty of federal participation in a partnership role. If the federal government is to be treated as just another party--i.e., as having no more impact on the decision making process than a small state, then federal reluctance to enter into compacts on that basis may be easily understood. That is not to say that in the political sense, when particular issues are before the interstate compact commission, the federal government's unique position would not be readily apparent, both because of the very real federal power to unmake most compact decisions, and because of the major role of the federal government in financing compact projects. Nevertheless, the fact that, structurally, interstate compacts provide for equal sovereignty gives some of the smaller states the power to delay and to affect decisions to a far greater degree than their participation would otherwise warrant.

Another interstate compact problem stems from the fact that interstate compact agencies have no political constituencies. Normally, the commissioners of an interstate compact agency are appointed by the governor of each of the party states. They are not responsible to any electorate, nor, for that matter, are they responsible to the governor himself, because the term of a commissioner of a compact agency commonly exceeds that of the governor who appoints him. This makes for great political independence, but it may also make for a lack of responsiveness.³⁸⁹

The recent interstate compact proposal, for the

ones) being applied to the actual installation of control devices.

For adequate pollution controls, a set of criteria ought to be developed to help determine the conditions which make uniform national or regional standards desirable or necessary. Enough experience has probably been collected in the regulation of air and water pollution to make such criteria possible. Such a set of criteria would then be properly applicable to the planning of mechanisms for the control of other pollutants as well. Thus, the problem of solid waste disposal is clearly emerging from a local and state issue into a national one. The nice question which will have to be answered before long is, when is the lack of a local solution to a problem so fraught with regional and national consequences that it properly becomes a regional or national concern? Some developments that invite comparison are taking place in noise pollution control. Because the jet plane--which has brought about the demand for noise controls--is clearly in interstate commerce, federal controls have been developed. In the case of muffler legislation for automobiles--though the automobile is involved in interstate commerce no less than the jet airplane--reliance has been placed on state legislation.³⁹¹ Muffler legislation is more effectively enforced as part of state motor vehicle inspection programs, but the need for national uniformity in the case of automobile mufflers may be no less great than the need for uniform standards affecting jet engines.

In all of these instances the problem is two-fold. The issue is not only what level of government should appropriately regulate the problem, but whether policy making and standard setting functions need to be the responsibility of the same level of government that is primarily responsible for enforcement. Thus far these issues have been resolved pragmatically. Since state and local governments were historically concerned with the environment in the traditional exercise of the police power, and since state and local governments, in consequence, were the ones that had staffs of inspectors, sanitarians and other enforcement personnel, enforcement has generally been lodged at the state and local level,³⁹² although policy making and standard setting has begun to move in the direction of higher levels of government. Thus, though regional air quality standards may be approved by the federal government, the emission controls--if enforced at all--are enforced by the local air pollution control officer. Whether policy and rule making, and enforcement should be divorced in this manner ought to be examined systematically. While the enlargement of federal enforcement machinery is generally looked upon with distrust, if not hostility, the question whether federal standard setting should not, in due course, lead to greater federal involvement in enforcement activities might well be explored. At the very least, devices must be found to prevent narrow local interests from determining the direction and rigor of the enforcement effort.

A recurring issue--raised again most recently in the context of the establishment of the National Council on Environmental Quality³⁹³--is the kind of agency suitable for effective environmental management generally. Traditionally, each field of environmental control and development has been treated separately and has had its own history of administration. Highway departments build highways and may from time to time be brought up short on environmental and scenic issues.³⁹⁴ Generally, conservation departments and recreation departments manage the state's recreational areas and forests quite independently from the concerns of the highway departments, which may build the roads which will bring people to recreational or wilderness areas. Neither the conservation and recreation department, nor the highway department directly concerns itself with problems of air or water pollution, which each of their particular activities may have bearing on.

With a growing concern for environmental management as a whole, questions have been raised whether the interrelationship between enforcement and development programs should be reflected in government agencies that have broad across-the-board responsibilities. The federal response has been the creation of the EPA, coordinating many environmental functions previously dispersed among other federal departments in a single agency. In a number of states this concern has led to the establishment of coordinating boards or agencies, frequently with ex officio membership drawn from among the commissioners and other department heads

that have primary responsibility for enforcement and development programs with environmental implications.³⁹⁵ Normally these coordinating boards or agencies have little power except to coordinate and advise. Their essential purpose is to make sure that commissioners of departments with responsibilities in related areas are aware of each other's programs, so that all of the programs in the state may consistently follow a common design. It is not clear whether such *coordinating* boards or agencies are effective. The common experience with ex officio agencies of that kind has not been good, quite simply because each commissioner or department head is responsible for his own program and is not likely to give coordination with other programs in the state a high priority. The legislation that established coordinating boards or agencies usually makes provision for department heads to send deputies to meetings,³⁹⁶ and in practice such coordinating boards or agencies consist of middle level government executives who are not free to make policy decisions themselves, but who must bring each decision back to their department head for consideration and approval. Consequently, coordinating boards and agencies have provided the outward appearance of coordination, though there is very little of it actually. The coordinating board or agency normally has no "line" functions, and the various departments have no line responsibility to it. At best they are likely to function as staff agencies with power to advise and cajole, but no power to direct and implement.

It is considerations of this nature that lead to

an attitude of "wait and see" with regard to the impact of both the National Environmental Policy Act of 1969 that created the Council on Environmental Quality, and the subsequent establishment of the Environmental Pollution Administration under a Federal Reorganization Plan that became effective in mid-1970. The enactment of the National Environmental Policy Act and the creation of the Council were greeted with high hopes and enthusiasm. Indeed, the Act has even been referred to as a long-awaited "environmental bill of rights."³⁹⁷ A more balanced analysis of the new legislation demonstrates that its future effectiveness depends to a far greater extent on agency and interagency cooperation with the Council's recommendations and on the support of the President than on any of the relatively limited powers the Congress has conferred upon it. To be sure, the initial response to the new legislation is promising, and it may be hoped that the early momentum of the Act will extend its effectiveness into the future. On its face, the Environmental Policy Act establishes the Council of Environmental Quality as an advisory body to the President.³⁹⁸ It has no line responsibility in any area of environmental development or regulation, and it has no authority to supervise, or in any way to inject itself into, the regulatory activities of any agency, or even to fulfill any coordinating role between agencies. It does not serve as a national environmental "ombudsman," empowered to mediate or arbitrate among agencies and groups of competing interests with regard to the

ecology. Its three members are appointed by the President (with the advice and consent of the Senate) and serve at his pleasure. Though the Council is to be "conscious of and responsive to the scientific, economic, social, esthetic, and cultural needs and interests of the Nation; and to formulate and recommend national policies to generate the improvement of the quality of the environment,"³⁹⁹ all of its recommendations, legislative and otherwise, its studies, surveys, and annual reports are to be addressed to the President, to whom alone the Council is responsible. The Act requires the President to report annually to Congress on the state of the ecology, and provides that the Council is to assist him in preparing the report.⁴⁰⁰ The first annual Council Report on the "State and Condition of the Environment" was presented to the President and was published in August 1970.⁴⁰¹ It is a skillfully prepared document of great significance.

The present Council is indeed a most prestigious body which appears to have the President's ear. Whether, in the long run, it can exercise a real influence on such operating agencies as the Environmental Protection Administration, the Department of Transportation or the Atomic Energy Commission remains to be seen. Early comments from at least one cabinet member--the Secretary of the Interior--would indicate that the effectiveness of the Council will depend entirely on the continuing support of the President. That cabinet member's rather pointed comments reflected the not uncommon attitude of agency heads

toward advisory bodies. Secretary Hickel, in an interview, said that the Council on Environmental Quality "is basically a watchdog" and "has great merit in interdepartmental coordination." He added, however, that the Council "obviously doesn't have the responsibility and I think that anything in government that has authority without responsibility finally becomes a very unworkable thing. . . .I don't know where they could stick their head in, to mean anything. You know, they're not going to run mines and minerals, they're not going over to HEW and run their programs."⁴⁰² Comments from other agency heads however, were more favorable, stressing the Council's capacity to act as a coordinating body that would avoid interagency disputes regarding the preservation of environmental values.⁴⁰³ It will clearly be able to carry out this function as long as it has Presidential support.

The initial expenditures authorized for the Council on Environmental Quality were rather slender, and there was some question whether the Council would be capable of operating effectively on such a small budget.⁴⁰⁴ Although it is not clear whether the move was favored by the Administration, the Council received some added assistance with the passage in 1970 of the new water pollution control act,⁴⁰⁵ which, in Title I created an Office of Environmental Quality in the Executive Office of the President, and authorized additional funds for it. The Office of Environmental Quality provides additional staff for the Council. Originally, in competition with the bill that eventuated

became the National Environmental Policy Act, the provisions of the law creating the Office of Environmental quality were ultimately adjusted so as to designate the Chairman of the Council on Environmental Quality to be the director of the Office. The bill does, however, provide for a deputy director, named by the President and subject to Senate confirmation. The position has not as yet been filled and thus the question of possible conflict between the Council and the Office has been avoided.

The National Environmental Policy Act, in one of its key provisions, contained in Section 102, directs that, "to the fullest extent possible" all agencies of the federal government interpret the policies and laws in accordance with the policies of the Act, and that all agencies shall

(A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decisionmaking which may have an impact on man's environment;

(B) identify and develop methods and procedures, in consultation with the Council on Environmental Quality established by title II of this Act, which will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decisionmaking along with economic and technical considerations;

The legislative history of the Act shows some Congressional concern over the meaning of the words "to the fullest extent possible."⁴⁰⁶ In any event, the direction to the agencies contained in the subsection quoted is a strong mandate to take environmental matters into account, not because they carry any very clear

meaning, but because they convey a significant mood. The more specific mandate to federal agencies is contained in subsection (C) which requires them to

(C) include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on--

- (i) the environmental impact of the proposed action,
- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the proposed action,
- (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
- (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Consultation with agencies, federal, state and local, that are concerned with particular environmental impacts is provided for; the statement, accompanied by the views of such other agencies, is to be made available to the President, the Council on Environmental Quality, as well as to the public, pursuant to the Freedom of Information Act.⁴⁰⁷ The Act is silent on what the Council is to do once it receives the statements, but it is clearly intended that the Council review the statements and take such informed action, directly or through advice to the President, as may be appropriate to advance the policies of the Act. Moreover, the availability of the reports to the public will give assurances that interested citizens and groups will be able to review the evidence supporting particular decisions that may have substantial environmental impact.

In an Executive Order that followed the enactment of the Act, the President directed the Council to issue guidelines to federal agencies for the preparation of Section 102(2)(C) statements;⁴⁰⁸ interim guidelines were promulgated on April 30, 1970.⁴⁰⁹ These guidelines, in turn, required the several agencies to establish formal procedures to identify agency actions requiring environmental statements, and for the preparation of the statements themselves. Based on the Act's legislative history, the interim guidelines freed the federal environmental protection agencies, such as NAPCA and FWQA, from the preparation of such statements. The interim guidelines make it clear that a serious, substantial review of environmental impact is required, rather than a mere formal finding that the environmental impact of proposed action will not be adverse, or cannot be avoided.

By September, 1970, a large number of Section 102 statements had been received by the Council, most as yet in preliminary form. The statements are being reviewed by the Council for compliance with the law and the guidelines.⁴¹⁰ It is apparent that many agencies are devoting major attention and a great deal of time and effort to the development of these statements; this, in turn, has served to delay a number of agency actions. Whether gains to the environment will justify these delays is not as yet clear, for there is as yet no evidence one way or the other whether the required review of environmental impacts will result in policy changes, or will merely result in more elaborate justification of policies determined

on other grounds. Paradoxically, the careful and painstaking preparation of Section 102 statements may have the result, in some instances, of protecting the agencies from the environmentalists, rather than the environment from the agencies. When an agency is challenged on some project by conservation or environmental protection organizations, judicial review is more likely to uphold agency action if it is supported by a detailed statement on environmental impact that covers every angle. If usual principles of administrative review are followed, the court will not substitute its judgment for that of the agency as long as the agency can show that it has, indeed, considered and verified all of the relevant facts in deciding to move ahead on some project that casts a burden on the environment.⁴¹¹ While agency activity in compliance with the requirements of the Act has been encouraging in the first six or eight months, it is too early to gauge the legislation's long-range effectiveness.⁴¹²

The early impact of the National Environmental Policy Act was encouraging in some other respects; in the first three months after its effective date, it was relied on in at least two judicial and three administrative decisions, and in every instance projects with adverse scenic or environmental impact were held up for further review--one of these decisions was the temporary injunction issued by the Federal District Court in Washington, D.C. forbidding the Interior Department to grant a permit to a group of oil companies to build a road across federal land in Alaska, preparatory to the construction of a planned oil pipeline across the Alaskan tundra.⁴¹³

Although the policy of the Act may aid environmental litigation, it carefully stops short of the express creation of a personal "right" to a clean environment. The Act declares that "The Congress recognizes that each person should enjoy a healthful environment and that each person has a responsibility to contribute to the preservation and enhancement of the environment."⁴¹⁴ The Senate-passed version of the bill had provided that "each person has a fundamental and inalienable right to a healthful environment," but this assertion was eliminated in conference.⁴¹⁵ Thus, the extent to which the Act will provide a basis for private litigation, or for litigation on behalf of the public interest by private groups remains uncertain.

The question, whether the responsibilities for enforcement ought to be lodged in specialized agencies having expertise in the management of particular aspects of environmental pollution or whether agencies charged with environmental protection generally are more appropriate, has been answered for the time being on an operationally significant level, by some recent state legislation⁴¹⁶ as well as by the new Federal Reorganization Plans.

The federal government has gone strongly in the direction of general protection under Reorganization Plans Nos. 3 and 4, submitted to Congress on July 9, 1970, effective sixty days later.⁴¹⁷ Reorganization Plan No. 4 established the National Oceanic and Atmospheric Administration whose primary purpose will be to coordinate research relating to the sea and

the atmosphere with an emphasis on securing future food, mineral and other resources. It is not directly concerned with the control and regulation of the environment but is significant in that it separates and recombines research functions of operating agencies. Thus, for instance, the Reorganization Plan abolishes the Environmental Science Services Administration in the Department of Commerce, established under Reorganization Plan No. 2 of 1965 which had transferred the regulatory control of water pollution to that department.⁴¹⁸

Of far more immediate significance is Reorganization Plan No. 3 which established the Environmental Protection Agency. Significantly, the agency is not a separate department nor is it made part of any department. It is headed by an administrator who does not appear to have cabinet rank, assisted by no more than five assistant administrators.⁴¹⁹ The Agency, which will have some five or six thousand employees transferred from existing operating agencies, will operate with a budget of \$1.4 billion as previously allocated.⁴²⁰ It is given no new powers but is the recipient of all of the powers legislatively granted to the component agencies transferred into it. The agencies and functions now combined in the Environmental Protection Agency are the following:

1. The Federal Water Quality Administration, essentially with all of the functions that had previously been transferred to the Department of Interior under Reorganization Plan No. 2 of 1966, as well as the functions vested in the Department

- of Interior with respect to studies on the effects of insecticides, herbicides, fungicides, and pesticides upon fish and wildlife resources, and with respect to some other pollution-related studies.
2. The Environmental Health Service, in the Department of HEW, including the National Air Pollution Control Administration and the Environmental Control Administration, with the Bureaus of Solid Waste Management, Water Hygiene and Radiological Health. Not transferred are the functions carried out by the Bureau of Community Environmental Management, the Bureau of Occupational Safety and Health, and the Bureau of Radiological Health insofar as its functions pertain to regulation of radiation from consumer products, radiation used in the healing arts, occupational exposure to radiation and research, technical assistance and training related to any of them.
 3. The functions vested in the Secretary of HEW relating to the establishment of tolerances for pesticide chemicals under the Federal Food, Drug and Cosmetic Act.
 4. The functions of the Atomic Energy Commission, as administered through its Division of Radiation Protection Standards, insofar as such functions consist of establishing generally applicable environmental standards for the protection from radioactive materials, as well as the functions of the Federal Radiation Council.
 5. The functions of the Secretary and Department of Agriculture under the Federal Insecticide, Fungicide,

Rodenticide Act, as well as the functions relating to that department under the Federal Food, Drug and Cosmetic Act and those administered through the Environmental Quality Branch of the Plant Protection Division of the Agricultural Research Service.⁴²¹

Transferred also were the Water Pollution Control Advisory Board and the Air Quality Advisory Board from the Departments of Interior and HEW, respectively, and "so much of the functions of the Council on Environmental Quality under. . . the National Environmental Policy Act of 1969. . . as pertains to ecological systems."⁴²² In submitting these reorganization plans to Congress, the President expressed the hope that the new Environmental Protection Administration would set environmental baselines for industry to follow and that it would work closely with the Council on Environmental Quality. He described the new agency's general job as that of focusing "on setting and enforcing pollution control standards."⁴²³

While the creation of the Environmental Protection Administration may be viewed as a significant first step in a coordinated attack on environmental pollution problems generally, it creates--as must every major reorganization of this kind--a number of problems of its own. First, while the new agency may successfully coordinate the Federal Government's attack on environmental pollution, it cannot deal with environmental problems generally because it has no jurisdiction over federal development programs that affect the environment nor does it have any role to play in conservation effort

of other agencies and departments. To be sure, this coordinating function might be played by the Council on Environmental Quality, though, as has been noted, its express powers are not exactly designed to accomplish this purpose. The new Environmental Protection Administration, in combining many agencies whose primary purpose is to fight pollution, had to relinquish some of the research functions which had previously been a part of those agencies and which are now continuing separately in the National Oceanic and Atmospheric Administration. There is, moreover, no guarantee that the different functions of the new Environmental Protection Administration will be carried on in any clearly integrated fashion. Each of the separate agencies transferred will still operate under its own basic law. The question remains whether a full and complete integration of functions will not require some basic changes in procedures and administration, thus necessitating basic changes in the underlying law.

There is a certain neatness in putting all or most environmental protection activities under a single agency. Clearly, there are important trade-offs in the field of pollution control, and the control of one aspect of pollution frequently affects another. If we have separate air pollution and water pollution control agencies, the argument goes, then whatever choices are made by one agency may improperly affect another, in the absence of a single locus of responsibility for the protection of the environment as a whole. On the other hand, it may be that the effective-

ness of regulatory controls is not necessarily enhanced by the establishment of larger departments with a multiplicity of responsibilities. While solid waste disposal, for instance, raises both water pollution and air pollution problems, the technology of water pollution control and air pollution control differ so widely, and the personnel that is employed to manage either effort differs so widely in background and training, that the establishment of a single agency to deal with both does not necessarily enhance the effective regulation of either. The suggestion has been made from time to time that since so many governmental development programs affect the environment, agencies charged with environmental protection ought to have a full range of responsibilities including such matters as road building, resource development, wetlands development, open space planning and recreation areas as well. Such experience as is available casts doubt, however, on the wisdom of lodging both regulatory and developmental responsibilities within a single agency. At this juncture, the establishment of the Federal Environmental Protection Agency, limited to the control of pollution, reflects the better of the available choices. But conscientious study and sound deliberation are still needed to develop agencies charged with broad responsibilities for environmental protection generally, with operating departments that develop expertise in particular areas of concern; integrated policy approaches then would be the business of the highest level of the agency. Clearly, there are no easy answers. The need for a broad,

coordinated policy for environmental protection as a whole has been recognized and acknowledged. The need for expertise in particular agencies and the question whether such expertise may be developed within the framework of a department with broader, more general responsibilities has not been fully explored. To be sure, the two approaches are far from mutually exclusive. The assumption, however, that a contribution to environmental control is made simply by a legislative combination of existing pollution control and conservation agencies into one mammoth department is probably ill placed. Unfortunately, much of the recent legislative effort at the state level has been precisely of this nature.⁴²⁴

A consideration of intergovernmental aspects of environmental controls would not be complete without a mention of some emerging governmental issues and priorities. In the present national concern for the environment, it is generally assumed that there is a national uniformity of interests in environmental protection and that there are no large political differences among the proponents of better environmental management. In actuality, there is a variety of interests involved in environmental protection, not all of which are wholly consistent with one another. One of the larger issues which is likely to develop among the environmentalists is the cleavage between the urbanist and the conservationists. While the environment is but a single, interrelated system, differences in approach are likely to be raised in terms of priorities and claims on scarce appropriations. Stated simplistically,

if a choice has to be made, shall we spend our resources to save the redwoods or preserve the cities? The preservation of the cities may well require the further expansion of power sources and the creation of more power plants and transmission lines that will have at least some deleterious effects on conservation and aesthetic values.⁴²⁵ We can have both conservation and scenery and the power, if we are willing--and able --to pay for it.⁴²⁶ But if not, then a political context for scarce resources is likely to develop and will need to be resolved by the legislature and by appropriate administrative agencies.⁴²⁷

Without denigrating the aims of the conservationists, it may be well to remember that, broadly defined, the environmental problems of the cities have given rise to grave and immediate political pressures. On the other hand, the legislatures--including the Congress--have often appeared to be more responsive to non-urban constituencies. A restructuring of governmental machinery for environmental controls will have to take account of such imbalances and try to make provision for their resolution.

Another aspect of environmental concern with intergovernmental implications, not referred to previously, is that of population control. By general consensus, no degree of environmental protection can restore the ecological balance, unless population growth is controlled.⁴²⁸ The legal machinery for population control is as yet undeveloped, though more liberal abortion legislation in a few states,⁴²⁹ and government programs for the dissemination of

family planning advice and health programs to make such advice effective⁴³⁰ are moves in that direction. There are a number of intergovernmental aspects in population regulation. Though population control has become a matter of national policy⁴³¹ and although there are federal programs to advance family planning, the states provide the laws relating to abortion,⁴³² and, until recently, they also controlled the issue of whether or not birth control and family planning information could be readily disseminated.⁴³³ A question which needs investigation is whether existing state laws regulating dissemination of planned parenthood information and other aspects of medical care that impinge on procreation, stand in the way of effectuating the national policy.

Finally, there is the inevitable problem of balancing economic growth and environmental exploitation.⁴³⁴ Emphasis on economic growth and industrial development has in the past lessened the concern for environmental protection. When industrial development and the creation of employment opportunities are emphasized, air pollution and water pollution control are likely to become secondary. In fact, numerous instances may be cited where conscientious choices were made to sacrifice environmental, recreational, and scenic values for the sake of economic development of a particular river or region.⁴³⁵ Any approach to intergovernmental aspects of pollution control has to include consideration of the fact that industrial and economic development is not uniformly advanced in all of the states and regions of the United States.

Hence, environmental controls are likely to fall most heavily upon those parts of the country that would now have the same freedom to exploit--and abuse--the environment for purposes of economic advancement as did other parts of the country some fifty or one hundred years ago that now find themselves in advanced stages of development. A national policy of environmental protection must find ways of ensuring that newly developing areas of the country are not kept in an industrially and economically backward state at the price of environmental protection for the rest. In most instances, economic growth is possible without undue burdens on the environment; it may simply be more costly. To the extent that economic development with adequate protection of the environment may be more costly than it was during the days when the environment was being despoiled, a way must be found to see that the environment policies of the present provide means to equalize the competitive advantage enjoyed by earlier exploitation.

Notes

1. Pub. L. No. 91-190, 83 Stat. 852 (1970).
2. Reorganization Plan No. 3 of 1970, H.R. DOC. NO. 91-364, 91st Cong., 2d Sess. (1970) [hereinafter cited as Reorganization Plan No. 3].
3. For a discussion of the direction of the national interest in the development of nuclear energy--and in radioactive protection--see p. 73, infra.
4. Jacobson v. Massachusetts, 197 U.S. 11, 25 (1904); Town of Shelby v. Cleveland Mill and Power Co., 155 N.C. 196, 200, 71 S.E. 218, 220 (1911); Berman v. Parker, 348 U.S. 26 (1954).
5. U.S. v. Carolene Products Co., 304 U.S. 144 (1938); Speert v. Morgenthau, 116 F.2d 301 (D.C. Cir. 1940); U.S. v. Patterson, 155 F. Supp. 669 (N.D. Ill. 1957).
6. Ch. 758, 62 Stat. 1155 (1948).
7. Hines, Nor Any Drop to Drink: Public Regulation of Water Quality, Part III: The Federal Effort, 52 IOWA L. REV. 799, 800 (1967).
8. Id. at 800.
9. Id.
10. The Water Quality Control Act of 1965, Pub. L. No. 89-234, § 1(a), 79 Stat. 903 (1965), 33 U.S.C.A. § 1153 et seq. (1970).
11. Id., § 1154.
12. Hines, supra note 7, at 802.
13. Ch. 360, §§ 1-7, 69 Stat. 322 (1955).

14. S. REP. NO. 389, 84th Cong., 1st Sess. 3 (1955).
15. Pub. L. No. 88-206, § 1, 77 Stat. 392 (1963).
16. Id. §§ 3(c)(3), 4-6 (now 42 U.S.C. §§ 1857b-d and subch. II (Supp. V, 1965-69)).
17. P. 103, infra.
18. See NATIONAL CENTER FOR AIR POLLUTION CONTROL, U.S. PUBLIC HEALTH SERVICE, A DIGEST OF STATE AIR POLLUTION LAWS (1967).
19. Pub. L. No. 88-206, § 4, 77 Stat. 392 (1963) (now 42 U.S.C. § 1857c (Supp. V, 1965-69)).
20. Motor Vehicle Air Pollution Control Act, Pub. L. No. 89-272, § 102 et seq., 79 Stat. 992 (1965) (now 42 U.S.C. subch. II (Supp. V, 1965-69)).
21. Id. § 204(s) (now 42 U.S.C. § 1857f-3(b) (Supp. V, 1965-69)).
22. Pub. L. No. 90-148, § 2, 81 Stat. 490 (1967), 42 U.S.C. § 1857c-2 (Supp. V, 1965-69).
23. Id. 42 U.S.C. §§ 1857c-2 and 1857d.
24. Id. § 1857d(k).
25. Id. §§ 1857f-1 and 1857f-6a.
26. Ch. 200, § 1 [1959] Cal. Stats. at 2091 as amended; Ch. 36, § 1 [1960] Cal. Stats. at 380 (repealed 1970); Ch. 2031, § 1 [1965] Cal. Stats. at 4606 (repealed 1970). Emissions standards are now authorized by CAL. HEALTH AND SAFETY CODE §§ 39080 et seq. (West Supp. 1970).
27. 42 U.S.C. §§ 1857f-1 and 1857f-6c (Supp. V. 1965-69).
28. Reorganization Plan No. 3 of 1970, § 2(a)(3) (i), (b)(2).
29. H.R. 17,199, 17,200, 17,393, 91st Cong., 2d Sess. (1970) (bills to amend the National Emission

Standards Act and to provide for elimination of automotive pollution).

30. 42 U.S.C. § 1857d(c) (Supp. V, 1965-69).

31. Id. § 1857a(c).

32. Hearings on Air Pollution Compacts before the Subcomm. on Air and Water Pollution of the Senate Comm. on Public Works, 90th Cong., 2d Sess. 459-66 (1968) [hereinafter cited as Hearings on Air Pollution Compacts].

33. 42 U.S.C. § 1857c-1(a) (Supp. V, 1965-69).

34. Id. § 1857c-1(b) (2).

35. Act of Aug. 5, 1886, ch. 929, 24 Stat. 329.

36. Ch. 425, § 13, 30 Stat. 1152 (1899), 33 U.S.C. § 407 (1964).

37. See, e.g., United States v. Republic Steel Corp., 362 U.S. 482 (1960), rehearing denied, 363 U.S. 858 (1960); United States v. Interlake Steel Corp., 297 F. Supp. 912 (N.D. Ill. 1969).

38. 37 Stat. 309 (1912), as amended, 42 U.S.C. § 241 (1964).

39. Hines, supra note 7, at 805.

40. Act of June 7, 1924, ch. 316, §§ 1-5, 7, 8, 43 Stat. 604-606 (repealed 1970). See p. 64, infra, for a discussion of recent legislation on oil pollution.

41. Hearings on H.R. 10625 Before the House Comm. on Rivers and Harbors, 71st Cong., 1st Sess. (1930).

42. For an instructive summary of these years, see Hines, supra note 7, at 805-09.

43. See S. 418, H.R. 123, H.R. 315, H.R. 470, 80th Cong., 1st Sess. (1947).

44. Act of June 30, 1948, ch. 758, §§ 2-13, 62 Stat. 1155.

45. Id. at 1155.

46. Hearings on S. 418 Before a Subcomm. of the Senate Comm. on Public Works, 80th Cong., 1st Sess. 30 (1947).

47. Act of June 30, 1948, ch. 758, § 10.

48. Act of July 17, 1952, ch. 927, 66 Stat. 755.

49. Federal Water Pollution Control Act, ch. 518, 70 Stat. 498 (1956).

50. Id. § 1.

51. Id. §§ 4-6.

52. Id. § 8.

53. Id. § 7.

54. Id. § 9.

55. 107 CONG. REC. 2585 (1961).

56. Act of July 20, 1961, Pub. L. No. 87-88, 75 Stat. 204.

57. Id. §§ 7(b).

58. 109 CONG. REC. 7304 (1963).

59. Pub. L. No. 89-234, §§ 1-8, 79 Stat. 903 (1965) (For a good summary of this process see Hines, supra note 7, at 825-29).

60. Id. § 1; Pub. L. No. 90-148, § 2, 81 Stat. 485 (1967).

61. Pub. L. No. 89-234, §§ 2,3,5, 79 Stat. 903 (1965)

62. Reorganization Plan No. 2 of 1966, 80 Stat. 1608

63. See Hearings Before the Subcomm. of the House Comm. on Government Operations, 89th Cong., 2d Sess. 24-26 (1966). This aim seemed quite reasonable in view

of the well known inconsistencies in the federal effort in the water resource area, e.g.:

The Department of Agriculture has paid North Dakota farmers to drain land while the Department of the Interior spends money to create and protect such wet lands for wild fowl breeding; the Department of Agriculture pays to remove land from agricultural production while the Bureau of Reclamation spends large sums to create agricultural lands; the Army Corps of Engineers dredges harbors in such a manner as to increase the pollution problems that the FWPCA is trying to abate. A. Reitze, Pollution Control: Why Has It Failed, 55 A.B.A.J. 923, 926 (1969).

64. Reorganization Plan No. 3, § 2(a)(1).

65. See Hines, supra note 7, at 833-38.

66. Pub. L. No. 89-753, 80 Stat. 1246 (1966).

67. Id. §§ 101, 201.

68. Id. §§ 101, 211. Some controversy has developed as to the meaning of "interstate" waters. As defined in 33 U.S.C. § 466j(e) (Supp. V, 1965-69) (repealed 1970), interstate waters included ". . . all rivers, lakes, and other waters that flow across or form a part of state boundaries, including coastal waters." The obvious difficulty arose over the term "coastal waters" which the FWPCA has attempted to give the broadest possible definition. The issue is not yet clearly resolved. See Bermingham, The Federal Government and Air and Water Pollution, 23 BUS. LAWYER 473, 475 (1968).

69. "Standards are water quality norms established for specific waters based on the present and future uses to be made of the waters and expressed, either descriptively or scientifically, in terms of the accepted quality parameters required for the designated uses." Hines, Controlling Industrial Water Pollution: Color the Problem Green, 9 B.C. INDUS. & COMM. L. REV. 553, 557-69 (1968).

70. 33 U.S.C.A. § 1160 (1970).

71. Pub. L. No. 89-753, § 206, 80 Stat. 1461 (1966).

72. COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY 44 (1st annual report 1970). [Hereinafter cited as CEQ]

73. Hines, supra note 69, at 586; M. Stein, Regulatory Aspects of Federal Water Pollution Control, 45 DENVER L.J. 267, 273 (1968).

74. Hines, supra note 69, at 584-87.

75. Stein, supra note 73, at 272.

76. The sole statutory direction was provided in 33 U.S.C. § 466(c) (3) (Supp. V, 1965-69) (repealed 1970).

Standards of quality established pursuant to this subsection shall be such as to protect the public health or welfare, enhance the quality of water and serve the purposes of sections 466-466g and 466h-466k of this title.

77. U.S. DEPARTMENT OF THE INTERIOR, GUIDELINES FOR ESTABLISHING WATER QUALITY STANDARDS FOR INTERSTATE WATERS (1966).

78. Bermingham, supra note 68, at 475.

79. 2 CCH WATER CONTROL NEWS, No. 38, at 10 (Feb. 5, 1968).

80. Hines, supra note 69, at 573.

81. Id.

82. Pub. L. No. 91-224, 84 Stat. 809 (1970).

83. See H.R. Rep. No. 91-127, 91st Cong. 2d Sess. 1 (1970).

84. Pub. L. No. 91-224, § 11(b) (1970), 33 U.S.C.A. § 1161(b) (1970).

85. Id., 33 U.S.C.A. § 1161.

86. Id. § 1162.

87. Id., §§ 1164-71.

88. For a discussion of the role of the Council on Environmental Quality see p. 166, infra.

89. See e.g., S. 3500, 3507, 91st Cong., 2d Sess. (1970) (bills to amend the Federal Water Pollution Control Act to ban polyphosphates in detergents by requiring that synthetic petroleum-based detergents manufactured in the United States or imported into the United States be free of phosphorus, and to establish standards and programs to abate and control water pollution by synthetic detergents) as reflective of the recent move to deal directly with emission and effluence.

90. CEQ, at 118.

91. See, generally, Hearings on S. 306 Before a Subcomm. of the Senate Public Works Comm., 89th Cong., 1st Sess. (1965).

92. Pub. L. No. 89-272, tit. II, 79 Stat. 992 (1965).

93. Id., § 202(b).

94. L. Johnson, Special Message to the Congress on Conservation and Relocation of National Beauty, Feb. 8, 1965 in 1965 PUBLIC PAPERS OF THE PRESIDENTS 155, 163.

95. Pub. L. No. 89-272, tit. III, § 208, 79 Stat. 991 (1965). These functions were transferred to the Administrator by Reorganization Plan No. 3, § 2(a)(3)(ii)(A).

96. CEQ, at 110 et seq.

97. L. Johnson, Annual Budget Message to Congress Fiscal Year 1967, Jan. 24, 1966 in 1966 PUBLIC PAPERS OF THE PRESIDENTS 47, 61.

98. See, e.g., S. 2005, H.R. 642, H.R. 1203, 91st Cong., 1st Sess. (1969); S. 2005, 91st Cong., 2d Sess. (1970).

99. See, e.g., NEW YORK CITY CHARTER AND ADMIN. CODE § 435-5.0 (1963).

100. E.g., N.Y. VEH. AND TRAFFIC LAW § 375(31) (McKinney Supp. 1970).

101. CCH, 1965-1970 CONG. INDEX.

102. H.R. 14602, 89th Cong., 2nd Sess. (1966); H.R. 2819, H.R. 13846, 90th Cong., 1st Sess. (1967).

103. Act of July 21, 1968, Pub. L. No. 90-411, 82 Stat. 395.

104. 34 Fed. Reg. 457, 3756, 18355 (1969).

105. Pub. L. No. 91-258, 84 Stat. 219 (1970).

106. 34 Fed. Reg. 7948 (1969).

107. Urban Noise Control, 4 COLUM. J.L. & SOC. PROB. 105-6 (1968).

108. U.S. GOV. PUBLICATIONS MONTHLY CATALOG (1965-69).

109. A. D. HOSEY and C. H. POWELL, INDUSTRIAL NOISE, GUIDE TO ITS EVALUATION AND CONTROL (1967).

110. BOLT, BERANEK & NEWMAN, INC., NOISE ENVIRONMENT OF URBAN AND SUBURBAN AREAS (1968).

111. Ch. 724, 60 Stat. 755 (1946).

112. Pub. L. No. 86-373, 73 Stat. 688 (1959).

113. Reorganization Plan No. 3, § 2(a)(6).

114. J. Pastore, Law & Technology: A Challenge to Democratic Government in NUCLEAR ENERGY, PUBLIC POLICY AND THE LAW 77, 81, quoting H. P. GREEN & A. ROSENTHAL, GOVERNMENT OF THE ATOM, 272-73 (1963).

115. Blaber v. U.S., 212 F. Supp. 95 (E.D.N.Y. 1962), aff'd, 332 F.2d 629 (2d Cir. 1964).

116. 73 Stat. 688 (1959), 42 U.S.C. § 2021(h) (1964) provides that the Chairman of the NCRP shall be consulted by the Federal Radiation Council; H. Green, The New Technological Era: A View from the Law, 23 BULLETIN OF THE ATOMIC SCIENTIST 16 (1967).

117. Executive Order No. 10831, 24 Fed. Reg. 5669, 42 U.S.C. § 2021(h) (Supp. V, 1965-69).

118. Id.

119. Pub. L. No. 86-373, 73 Stat. 688 (1959).

120. Id., 42 U.S.C. § 2021(d)(1) (1964).

121. Id. § 2021(d)(2).

122. Letter from John W. Gofman to Dr. Janet Karlson, January 2, 1970, delivered at a meeting at McMillin Theater, Columbia University on January 8, 1970.

123. U.S. ATOMIC ENERGY COMMISSION, CIVILIAN NUCLEAR POWER--A REPORT TO THE PRESIDENT (1962).

124. N.Y. Times, Jan. 15, 1970, at 24, col. 3.

125. M. Eisenbud, Environmental Safety in the Nuclear Age, in NUCLEAR ENERGY, PUBLIC POLICY AND THE LAW, supra note 114, at 53-55.

126. In the matter of Northern States Power Co., 2 CCH 1967 ATOM. EN. L. REPORTER, ¶ 11,2641 (a report of administrative action taken by the Atomic Energy Commission in issuing a provisional permit for construction of a nuclear reactor). See id., 1970 ¶ 1076 for further developments (report approving the operation of the Monticello Nuclear Generating Plant at increased power levels).

127. E.g., N.Y. PUBLIC HEALTH LAW §§ 1264 et seq. (McKinney Supp. 1970); WIS. STAT. ANN. §§ 144.42 (Supp. 1970-71).

128. D. Greene, J. Kyle, J. Watson, The Texas Water Quality Bond, 48 TEX. L. REV. 1047 (1970).

129. Pub. L. No. 91-190, 83 Stat. 852 (1970).

130. Id.

131. Halliday, A Historical Review of Atmospheric Pollution, in AIR POLLUTION 13, 14 (World Health Organization 1961); CHARLESWORTH, LIABILITY FOR

DANGEROUS THINGS 130, 140-42 (1922).

132. E. W. GARRETT, THE LAW OF NUISANCES 125, 135 (3rd ed. 1908).

133. COUNCIL OF STATE GOVERNMENTS, SUGGESTED STATE LEGISLATION PROGRAM FOR AIR POLLUTION CONTROL 42-3 (1958); see also id., at 132 (1959).

134. Pub. L. No. 90-148, 81 Stat. 485 (1967), 42 U.S.C. § 1857 et seq. (Supp. V, 1965-69).

135. See, e.g., IDAHO CODE ANN. § 39-2901 et seq. (1961); NEV. REV. STAT. § 445.400 et seq. (1967); MICH. COMP. LAWS ANN. § 336 et seq. (1967); MINN. STAT. ANN. § 144.12 (1970); DEL. CODE ANN. tit. 7, § 7-6201 et seq. (1968).

136. See, e.g., IDAHO CODE ANN. § 39-2903 (Supp. 1967); NEV. REV. STAT. § 445.445 (1967); MICH. COMP. LAWS ANN. § 336.16 (1967).

137. See, e.g., DEL. CODE ANN. tit. 3, § 7-6203 (1968).

138. See, e.g., MICH. COMP. LAWS ANN. § 336.15(m) (1967); NEV. REV. STAT. § 445.515 (1967); DEL. CODE ANN. tit. 7, § 7-6203 (1968).

139. FLA. STAT. ANN. § 403.182 (Supp. 1969).

140. COL. REV. STAT. § 66-29-6(6) (Supp. 1967).

141. E.g., PENN. STAT. ANN. tit. 35 § 4006 (Purdon's Supp. 1970).

142. E.g., ALASKA STAT. ANN. § 18-30-180 (1969); N.C. GEN. STATS. § 143-215.3(a) (11) (c) (Supp. 1967).

143. E.g., CONN. STATS. ANN. § 19-520a (Supp. 1969).

144. Council of State Governments, State Air Pollution Control Act, 26 SUGGESTED STATE LEGISLATION A3 (1967).

145. See p. 117, infra.

146. E.g., ARIZ. REV. STAT. ANN. §§ 36-1702, 37-1703 (Supp. 1969-70).
147. E.g., WYO. STAT. ANN. § 35-490 (1957); UTAH CODE ANN. § 26-24-4 (1953).
148. See, e.g., Norvell & Bell, Air Pollution Control in Texas, 47 TEX. L. REV. 1086, 1092 (1969).
149. Id. at 1120.
150. E.g., Stamford, Conn., Ordinance No. 21, June 15, 1950; WILMINGTON, DELA., CITY CODE §§ 312-315.
151. E.g., Fulton County, Ga., Board of Health Reg. No. 2, January 17, 1952.
152. E.g., St. Paul, Minn., Ordinance No. 9275, May 10, 1949.
153. E.g., Birmingham, Mich., Ordinance No. 450, April 5, 1954.
154. E.g., MIAMI BEACH, FLA., CITY CODE §§ 22.68-22.68.9 (1958).
155. E.g., AIR POLLUTION CONTROL DIST. OF LOS ANGELES COUNTY, RULES AND REGS., Reg. II, Rules 10-14, 17-25, Reg. III, Rules 40, 42-44; CHICAGO, ILL., MUNIC. CODE, ch. 17, May 1, 1959.
156. Hutchins, Background and Modern Developments in Water Law in the United States, 2 NAT'L RES. J. 416, 422 (1962); Stein, Problems and Programs in Water Pollution, Id., at 388, 404 (1962).
157. Hutchins, supra note 156, at 420.
158. Hines, supra note 7, at 202-03.
159. E.g., ch. 18, § 1 [1864] IOWA ACTS; ch. 441, §§ 2,5 [1890] MASS. ACTS.
160. E.g., ch. 162, § 2 [1872] IOWA ACTS.
161. E.g., ch. 16, § 11 [1797] MASS. ACTS AND

LAWS; 1 LAWS OF NEW YORK 415 (Greenleaf 1787).

162. See GRAHAM, DISASTER BY DEFAULT (1966).

163. This ad hoc delegation of regulatory powers to presently existing state agencies is illustrated in Carmichael, Forty Years of Water Pollution Control in Wisconsin, 1967 WISC. L. REV. 350, 352-59.

164. E.g., ch. 41, § 1 [1899], N.J. SESS. LAW.

165. Hines, supra note 7, at 203, 204.

166. Carmichael, supra note 163, at 354.

167. E.g., WIS. STAT. ANN., § 144 (Supp. 1969).

168. TEX. REV. CIV. STAT. ANN. art.762ld-1, § 3.14 (Supp. 1969).

169. Id., § 2.02.

170. Tyler, Methods for State Level Enforcement of Air and Water Pollution Laws, 31 TEX. BAR J. 905, 973 (1968).

171. TEXAS REV. CIV. STAT. ANN. art. 762ld-1, §§ 2.09, 2.10 (Supp. 1969).

172. FLA. STAT. ANN. §§ 403.041, 403.061 (Supp. 1969).

173. Id., § 403.071.

174. OKLA. STAT. tit. 82, § 932 (a) (1970).

175. Id., §§ 932 (b), 933 (a), 934, 935 (1970).

176. Ch. 7, § 4 [1960] LAWS OF N.Y. as amended, ch. 490, § 7 [1961] LAWS OF N.Y. (repealed 1970); ch. 666, §§ 1, 2 [1965] LAWS OF N.Y.; N.Y. PUB. HEALTH LAW §§ 1205 et seq. (McKinney Supp. 1969-70).

177. N.Y. ENVIRONMENTAL CONSERVATION LAW (McKinney Supp. 1970).

178. Comment, Water Pollution Control in New York, 31 ALBANY L. REV. 50, 60 (1967).

179. MURPHY, WATER PURITY 145 (1961).
180. Hines, supra note 7, at 218.
181. E.g., OKLA. STAT. tit. 82, § 932(b) (Supp. 1968).
182. E.g., N.M. STAT. ANN. § 75-39-3 (1968).
183. MURPHY, supra note 179, at 145.
184. Comment, Water Pollution--State Control Committee, 17 VAND. L. REV. 1364, 1369 (1964).
185. E.g., HAWAII REV. STAT. § 177-3 (Supp. 1965).
186. Bower, Some Physical, Technological, and Economic Characteristics of Water and Water Resource Systems, 3 NATURAL RES. J. 215, 219 (1963).
187. Such a grant may be broad indeed. In Application of City of Johnstown, 12 App. Div. 218, 209 N.Y.S.2d 982 (1961), the "waters of the state" were held to include all fresh water in streams, public or private, even though non-navigable.
188. PA. STAT. ANN. tit. 71, § 540(4) (1962).
189. E.g., N.M. STAT. ANN. § 40A-8-3 (1953).
190. E.g., N.Y. PUBLIC HEALTH LAW §§ 1210(1), 1220 (McKinney Supp. 1969).
191. For a representative list of powers commonly granted, see Hines, supra note 7, at 221.
192. PRESIDENT'S SCIENCE ADVISORY COMMITTEE (ENVIRONMENTAL POLLUTION PANEL), RESTORING THE QUALITY OF OUR ENVIRONMENT (1965).
193. N.Y. PUBLIC HEALTH LAW § 1205(2) (McKinney Supp. 1969).
194. Id., § 1205(3).
195. City of Utica v. Water Pollution Control Board, 5 N.Y.2d 164, 156 N.E.2d 301, 182 N.Y.S.2d 584 (1959).

196. City of Huntington v. State Water Committee, 137 W.Va. 786, 73 S.E.2d 833 (1953) (due process); Madison Metropolitan Sewerage District v. Committee on Water Pollution et al., 260 Wis. 229, 50 N.W.2d 424 (1951) (equal protection).

197. State Board of Health v. City of Greenville, 86 Ohio St. 1, 98 N.E. 1019 (1912); Board of Purification of Waters v. Town of Bristol, 51 R.I. 243, 153 A. 879 (1931).

198. NEW YORK CITY HEALTH CODE, § 143.11 (1959).

199. Id., § 143.13.

200. E.g., Solid Waste Disposal Act of 1965, Pub. L. No. 89-272, 79 Stat. 997 (1965), 42 U.S.C. § 3251 et seq. (Supp. V. 1965-69).

201. E.g., N.Y. MUNICIPAL HOME RULE LAW §§ 10, 36, 37 (McKinney 1969); 1 NEW YORK CITY CHARTER AND ADMINISTRATIVE CODE § 751 et seq. (Supp. 1969-70).

202. E.g., NEW YORK CITY HEALTH CODE §§ 81.37(h), 131.11 (1959); REVISED CODE OF THE CITY OF ST. LOUIS, Ord. 51398, § 1 generally (B. B. No. 196) (1962).

203. BOCA BASIC HOUSING CODE §§ H-335.0, H-404.0, H-405.0; HOUSING REGULATIONS OF THE DISTRICT OF COLUMBIA §§ 2609, 2610 (1964).

204. NEW YORK CITY CHARTER AND ADMINISTRATIVE CODE §§ B32 - 267.0, 755(2) - 6.2 (1970); N. Y. PUBLIC HEALTH LAW §§ 1360-64 (McKinney Supp. 1969).

205. 10 CODES, RULES AND REGULATIONS OF THE STATE OF NEW YORK § 19.2(4) (State Sanitary Code) (1962); NEW YORK CITY HEALTH CODE § 152.23 (1959).

206. 10 CODES, RULES AND REGULATIONS OF THE STATE OF NEW YORK §§ 19.3, 19.4 (1962). See also controversial Local Law 14, 5 NEW YORK CITY CHARTER AND ADMINISTRATIVE CODE § 892-1.0 et seq. (Supp. 1969-70), aimed at controlling air pollution from apartment house incinerators and oil burners. This law, one of the most stringent and comprehensive of air pollution codes, was upheld May 25, 1970, by the courts after a three-year

challenge by the real estate industry. *Oriental Blvd. v. Heller*, 58 Misc.2d 920, 297 N.Y.S.2d 431, aff'd, 34 A.D. 2d 811, 311 N.Y.S.2d 635 (N.Y. App. Div.2d Dept. 1970).

207. N.Y. Times, June 4, 1969, at 34, col. 2.

208. E.g., ARIZ. REV. STAT. ANN. §§ 36-1319-1326, ch. 11 generally (1956); MASS. GEN. LAWS ANN. ch. 40, §§ 44c, 44f (1966).

209. E.g., 4 NEW YORK CITY CHARTER AND ADMINISTRATIVE CODE § B32-267.0 (1970).

210. See p. 70, infra.

211. For a tabulation of these laws, see Kaufman, Control of Noise Through Laws and Regulations in NOISE AS A PUBLIC HEALTH HAZARD 340 (Proceedings of the Conference of the American Speech and Hearing Association, Washington, D.C., June 1968, 1969).

212. E.g., CODES, RULES AND REGULATIONS OF THE STATE OF NEW YORK, ch. V, subch. E (1963). See J. Kaufman, *The Legal Aspects of Noise Control*, in 115 Cong. Rec. E9031, E9041 (1969) for a compilation of state and local laws.

213. NEW YORK CITY CHARTER AND ADMINISTRATIVE CODE § 435-5.0(a) (1963).

214. Id., § 435-5.0(b).

215. CODE OF GENERAL ORDINANCES OF CITY OF PHILADELPHIA §§ 10-(401-408) (1956).

216. MUNICIPAL CODE OF CHICAGO § 99-58 (1969).

217. NEW YORK CITY ZONING RESOLUTION art. IV, §§ 42-(20-22) (1960).

218. N.Y. MULTIPLE DWELLING LAW § 84 (McKinney Supp. 1969-70); 4 NEW YORK CITY CHARTER AND ADMINISTRATIVE CODE RS12-(2-4) (1963).

219. NEW JERSEY REGS. FOR THE CONSTRUCTION AND MAINT. OF HOTELS AND MULT. DWELLINGS, art. 18, July 19, 1967. Issued pursuant to ch. 76 LAWS OF NEW JERSEY (1967).

220. For a discussion of the weak enforcement provisions of federal law see p. , infra.

221. Pub. L. No. 88-206, 77 Stat. 392 (1963).

222. Pub. L. No. 90-148, 81 Stat. 491 (1967).

223. Id., 42 U.S.C. § 1857d(d) (1) (B) (Supp. V, 1965-69).

224. Id., § 1857d(k).

225. H.R. Rep. No. 728, 90th Cong., 1st Sess. 19 (1967).

226. S. Rep. No. 403, 90th Cong., 1st Sess. 31 (1967); H. Rep. No. 728, 90th Cong., 1st Sess. 19 (1967).

227. 81 Stat. 490 (1967), 42 U.S.C. § 1857c-2 (Supp. V, 1965-69).

228. Id., 42 U.S.C. § 1857d(c) (4).

229. Id., § 1857d(d) (1) (A).

230. Id., § 1857d(d) (1) (C).

231. United States v. Bishop Processing Co., 287 F. Supp. 624, 632 (D. Md. 1968), aff'd, 423 F.2d 469 (4th Cir. 1970), cert. denied, 398 U.S. 904 (1970).

232. 81 Stat. 495 (1967), 42 U.S.C. § 1857d(d) (2) (Supp. V, 1965-69).

233. It has been suggested that this informal procedure is a necessary result of the nature of the conference. It is basically a meeting of all the governmental agencies involved to consider a problem of common concern in the light of all the information available in order to arrive at the remedial action necessary. Edelman, Air Pollution Abatement Procedures Under the Clean Air Act, 10 ARIZ. L. REV. 30, 32 (1968).

234. 81 Stat. 495 (1967), 42 U.S.C. § 1857d(d) (3), (e), (f) (1) (Supp. V, 1965-69).

235. See 32 Fed. Reg. 5514 (1967) for the

procedures proposed by the Secretary of HEW, and followed in the only hearing held so far.

236. 81 Stat. 496 (1967), 42 U.S.C. § 1857d(f) (2) (3) (Supp. V, 1965-69).

237. U.S. v. Bishop Processing Co., 287 F. Supp. 624, 633 (D.C. Md. 1968), aff'd, 423 F.2d 469 (4th Cir. 1970), cert. denied, 398 U.S. 904 (1970).

238. 81 Stat. 496 (1967), 42 U.S.C. § 1857d(g) (Supp. V, 1965-69).

239. Id., 42 U.S.C. § 1857d(h).

240. Martin & Symington, A Guide to the Air Quality Act of 1967, 33 LAW AND CONTEMP. PROB. 239, 266 (1968).

241. 81 Stat. 496 (1967), 42 U.S.C. § 1857d(h) (Supp. V, 1965-69).

242. Edelman, supra note 233, at 34.

243. The history of the case can be found in 423 F.2d 469, 470 (4th Cir. 1970). Cert. was denied in 398 U.S. 904 (1970).

244. 80 Stat. 1250 (1966), 33 U.S.C.A. §§1160(a), (d) (1) (1970).

245. Id., 33 U.S.C.A. §§1160(d) (1), (2).

246. Id., §§1160(d) (1)-(4), (e), (f), (g).

247. Stein, supra note 73 at 278. For a detailed analysis of the forty abatement conferences held through November 1966, see Hines, supra note 7, at 855-56.

247a. Pub. L. 89-234, § 5(a); 33 U.S.C.A. § 1160(c)(5)(1970).

248. F. P. GRAD, PUBLIC HEALTH LAW MANUAL 222 et seq. (1970) [hereinafter cited as MANUAL].

249. See, e.g., United States v. Republic Steel Corp., 362 U.S. 482 (1960), rehearing denied, 363 U.S. 858 (1960); United States v. Interlake Steel Corp., 297 F. Supp. 912 (N.D. Ill. 1969).

250. 30 Stat. 1151 (1899), 33 U.S.C. 401 et seq. (1964).

251. N.Y. Times, Jan. 15, 1970, at 1; Feb. 10, 1970, at 1; Mar. 27, 1970, at 66; and Ap. 22, 1970, at 35.

252. 81 Stat. 500 (1967), 42 U.S.C. §§ 1857f-3(a), 1857f-4 (Supp. V, 1965-69).

253. Reorganization Plan No. 3 of 1970, § 2(a)(3).

254. 81 Stat. 501 (1967), 42 U.S.C. § 1857f-5(a) (Supp. V, 1965-69).

255. Id., § 1857f-5(b).

256. N.Y. Times, April 19, 1970 at 16, cols. 4-6 (quoting John Middleton, head of National Air Pollution Control Administration).

257. In a test run by the Los Angeles Air Pollution Control District 87% of vehicles driven over 20,000 miles failed to meet state standards. Hearings Before the Subcomm. on Air and Water Pollution of the Senate Comm. on Public Works, 90th Cong., 2d Sess., ser. 90-82, pt. 1, at 225 (1967).

258. CAL. HEALTH AND SAFETY CODE §§ 39080 et seq. (West Supp. 1970). See also p.156, infra and A. Rosenthal, Federal Power to Preserve the Environment: Enforcement and Control Techniques, infra at 233.

259. S. Rep. No. 1353 90th Cong., 2d Sess. (1968).

260. Allegheny Airlines v. Village of Cedarhurst, 132 F. Supp. 871 (E.D.N.Y. 1955), aff'd, 238 F.2d 812 (2d Cir. 1956); American Airlines Inc. v. Town of Hempstead, 272 F. Supp. 226 (E.D.N.Y. 1967), aff'd, 398 F.2d 369 (1968) (holding village ordinances explicitly and implicitly barring aircraft from lower air, in an effort to decrease aircraft noise, invalid as conflicting with federal law in an area of federal preemption); 34 Fed. Reg. 18356 (1969) in which FAA posits support of local controls stating "The judicial decisions and legislative history of Public Law 90-411 [the Noise Abatement Act] have made it clear that the Federal Government should not substitute its judgment

for that of the airport operator . . . and that the Federal Government should recognize the airport operator's right to issue regulations or establish requirements as to the permissible level of noise which can be created by aircraft using the airport."

261. 34 Fed. Reg. 18355 (1969) sets forth a summary of public comments generally concluding that standards should be changed.

262. Hearings on H.R. 3400 & H.R. 14146 before the Subcomm. on Transportation and Aeronautics of the House Comm. on Interstate and Foreign Commerce, 90th Cong., 1st and 2nd Sess., at 89,91,97,100,152 (1968).

263. S. Rep., supra note 259.

264. This problem was addressed by subsection k of the 1959 amendment which specifically reserved to the state the authority "to regulate activities for purposes other than protection against radiation hazards." Pub. L. No. 86-373, 73 Stat. 688 (1959).

265. Atomic Energy Act of 1954, ch. 1073, 68 Stat. 921.

266. 73 Stat. 688 (1959), 42 U.S.C. § 2021 (1964).

267. 34 Fed. Reg. 18356 (1969).

268. E.g., N.Y. PUBLIC HEALTH LAW §§ 1100 et seq., 1205, 1210 (McKinney Supp. 1969); ARIZ. REV. STAT. ANN. § 36-1702 (Supp. 1969-70).

269. E.g., WIS. STAT. ANN. § 144.31(1)(c) (Supp. 1970).

270. E.g., FLA. STAT. ANN. § 403.182 (Supp. 1970).

271. E.g., MINN. STAT. ANN. § 145.01 (1970).

272. E.g., N.Y. PUBLIC HEALTH LAW § 1264 et seq. (McKinney Supp. 1969).

273. MANUAL, at 16 et seq. For an account of a county in search of an air pollution code see R. Cusumano and G. Wasser, Initial Experiences with the Comprehensive Air Pollution Survey in Nassau County, New York, 13

JOURNAL OF THE AIR POLLUTION CONTROL ASSOCIATION 281
(1963).

274. See MANUAL, at 16 et seq.

275. Id.

276. ". . . the uncertain limits of municipal power have had a stultifying effect on local initiative. Since local officials must consider whether a prospective ordinance might fall outside the area of 'property, affairs, or government,' [many will] be restrained in exercising their lawmaking functions." Note, Home Rule and the New York Constitution, 66 COLUM. L. REV. 1145, 1154 (1966).

277. MANUAL, at 20.

278. F. Grad, The State's Capacity to Respond to Urban Problems: The State Constitution in THE AMERICAN ASSEMBLY, THE STATES AND THE URBAN CRISIS at 46, 47 (A. Campbell ed. 1970).

279. E.g., NEW YORK CITY HEALTH CODE § 143.01 et seq. (1959); Brooklyn, N.Y., Rules and Regulations of the Borough President Pertaining to the Issuance of Permits for the Construction of Septic Tanks and Cesspools in Sidewalk Areas.

280. N.Y. PUBLIC HEALTH LAW § 12-b(1), (2) (McKinney Supp. 1969).

281. E.g., NEW YORK CITY HEALTH CODE §§ 143.05(a), 143.13(a) (1959).

282. Id., § 143.13(a) (1959).

283. Id., notes to § 143.11.

284. Id. § 143.11.

285. E.g., N.Y. PUBLIC HEALTH LAW §§ 1180 (New England Interstate Water Pollution Control Compact), 1190 (Ohio River Valley Water Sanitation Compact), 1299 (Tri-State Compact) (McKinney Supp. 1969).

286. E.g., id., § 1188, art. ix (New England Interstate Water Pollution Control Compact).

287. E.g., id., § 1240; KY. REV. STAT. § 224.080 (1969).

288. E.g., ALASKA STAT. § 46.05.190 (1962); GA. CODE ANN. § 17-520 (Supp. 1965); KY. REV. STAT. § 224.070 (1969).

289. E.g., ALA. CODE, tit. 22 § 140(9) (n) (Supp. 1969); FLA. STAT. ANN. § 403.121(2) (Supp. 1969).

290. N.Y. PUBLIC HEALTH LAW § 1242(7) (McKinney Supp. 1969).

291. MISS. CODE ANN. §§ 7106-127 (1968).

292. FLA. STAT. ANN. § 403.161 (Supp. 1969).

293. N.Y. PUBLIC HEALTH LAW § 1252(1) (McKinney Supp. 1970).

294. E.g., FLA. STAT. ANN. § 403.161(3) (Supp. 1970); KY. REV. STAT. § 224.990 (1969).

295. E.g., N.Y. PUBLIC HEALTH LAW § 1251 (McKinney Supp. 1970).

296. E.g., N.Y. PUBLIC HEALTH LAW § 1244 (McKinney Supp. 1970).

297. E.g., GA. CODE ANN. §§ 3A-120, 17-513 (Supp. 1969).

298. E.g., ALA. CODE, tit. 22, § 140(9) (n) (Supp. 1967); LA. REV. STAT. § 56:1442 (1952).

299. Hearings on S. 649, S.737, S.1118, S.1183 Before a Special Subcomm. on Air and Water Pollution of the Senate Comm. on Public Works, 88th Cong., 1st Sess., at 98 (1963).

300. Hines, supra note 7, at 227.

301. State Board of Health v. City of Greenville,

86 Ohio St. 1, 98 N.E. 1019 (1912); Board of Purification of Waters v. Town of Bristol, 51 R.I. 243, 153 A. 879 (1931).

302. NEW JERSEY REGULATIONS FOR THE CONSTRUCTION AND MAINTENANCE OF HOTELS AND MULTIPLE DWELLINGS § 1902.4 (Department of Community Affairs July, 1968).

303. Id., §§ 105.0, 107.0(b).

304. E.g., NEW YORK CITY HEALTH CODE § 153.23 (1959).

305. 4 NEW YORK CITY CHARTER AND ADMINISTRATIVE CODE § 755(4)-2.0 (Supp. 1970).

306. N.Y. VEH. AND TRAFFIC LAW § 1224 generally, and, more particularly, § 1224(9) (McKinney 1970) which would make it possible for the New York State Dept. of Motor Vehicles to connect an abandoned car's Vehicle Identification Number with its last registered owner through use of a computer.

307. City of New York, Rules and Procedures of the Police Department §§ 3/94.0-.4 (1970).

308. E.g., N.Y. LABOR LAW §§ 21(1)(2)(8), 25, 39, 40 (McKinney 1965); id. § 213 (McKinney Supp. 1970-71).

309. E.g., N.Y. VEH. AND TRAFFIC LAW § 375(32) (McKinney Supp. 1970). See also, Note, Urban Noise Control, 4 COLUM. J. L. & SOC. PROB. 105 (1968) for a general discussion of enforcement experience.

310. N.Y. VEH. AND TRAFFIC LAW § 301 et seq. (McKinney Supp. 1970).

311. Reorganization Plan No. 3 of 1970.

312. 73 Stat. 688 (1959), 42 U.S.C. § 2021 generally (1964).

313. 4 CCH-ATOMIC ENERGY LAW REPORTER, which sets forth the statutes of the states and territories governing jurisdiction in the atomic energy field.

314. E.g., S.D. COMP. LAWS ANN. §§ 34-21-(18-21) (1967).

315. N.Y. PUB. HEALTH LAW §§ 225(3), (4) (McKinney Supp. 1969).

316. E.g., CAL. HEALTH & SAFETY CODE §§ 25732, 25840 (West 1954).

317. N.Y. PUB. HEALTH LAW §§ 225(3), (4) (McKinney Supp. 1970-71).

318. 1 NEW YORK CITY CHARTER AND ADMINISTRATIVE CODE § 558 (1963).

319. 10 CODES, RULES AND REGULATIONS OF THE STATE OF NEW YORK §§ 16.40, 16.50, 16.100-.111 [hereinafter cited as State Sanitary Code]; NEW YORK CITY HEALTH CODE §§ 175.03, 175.05, 175.07, 175.21(a) (b) (1963); 12 CODES, RULES AND REGULATIONS OF THE STATE OF NEW YORK, Rules 38.0-.19 [hereinafter cited as Industrial Code] (applying to any radiation source not subject to regulatory jurisdiction of the State or City Departments of Health); N.Y. PUB. HEALTH LAW §§ 3502, 3504-10, 3512, 3514, 3515 (McKinney Supp. 1970).

320. 73 Stat. 688 (1959), 42 U.S.C. §§ 2021(c) (1) (3), 2039 (1964).

321. Industrial Code, pt. 38 generally, as amended, August 1963 and February 1964.

322. N.Y. LABOR LAW § 213 (McKinney Supp. 1969); State Sanitary Code § 1.21; N.Y. PUBLIC HEALTH LAW § 12-b (McKinney Supp. 1969).

323. NEW YORK CITY HEALTH CODE §§ 175.09(c), (d), (e) (1959).

324. 68 Stat. 930 (1954), as amended, 42 U.S.C. § 2073 (1964); 68 Stat. 932 (1954), 42 U.S.C. § 2092 (1964); 68 Stat. 933, 42 U.S.C. § 211 (1964).

325. 81 Stat. 491 (1967), 42 U.S.C. § 1857d(c) (Supp. V, 1965-69); 80 Stat. 1248 (1966), 33 U.S.C. §§ 466d(f), (g) (Supp. V, 1965-69).

326. 80 Stat. 1249-1251 (1966), 33 U.S.C. § 466e (Supp. V, 1965-69); 82 Stat. 534 (1968), 42 U.S.C. § 3102 (Supp. V, 1965-69).

327. 73 Stat. 688 (1959), 42 U.S.C. § 2021 (1964).

328. E.g., N.Y. GEN. MUNICIPAL LAW § 119-0 (McKinney 1954), §§ 111-116, 120-a, 120-t, 120-u (McKinney Supp. 1963); N.Y. TOWN LAW § 198(1) (3) (McKinney 1965).

329. E.g., N.Y. GEN. MUNICIPAL LAW § 119-0(2) (a) (c) (McKinney 1954); N.Y. TOWN LAW § 215(1-a) (McKinney 1965).

330. E.g., N.Y. GEN. MUNICIPAL LAW §§ 120t, 120v (1963).

331. E.g., N.Y. TOWN LAW § 198(4) (McKinney 1965 and Supp. 1969); ADVISORY COMMISSION ON INTERGOVERNMENTAL RELATIONS, PERFORMANCE OF URBAN FUNCTIONS: LOCAL AND AREA WIDE 92-3, 106-7 (1963). J. FESLER, THE 50 STATES AND THEIR LOCAL GOVERNMENTS 522-31 (1967); S. SIEGEL, THE LAW OF OPEN SPACE 3, 7 (Park, Recreation and Open Space Project of the Tri-State New York Metropolitan Region 1960).

332. ADVISORY COMMISSION ON INTERGOVERNMENTAL RELATIONS, METROPOLITAN COUNCILS OF GOVERNMENTS: AN INFORMATION REPORT (1966); 1968 STATE LEGISLATIVE PROGRAM OF THE ADVISORY COMMISSION ON INTERGOVERNMENTAL RELATIONS, A REPORT ON METROPOLITAN AND REGIONAL ORGANIZATION AND ADMINISTRATION 372 et seq.; PERFORMANCE OF URBAN FUNCTIONS, supra note 331 at 24-60, and FESLER, supra note 331 at 532-549.

333. E.g., SAN FRANCISCO, BY-LAWS OF THE ASSOCIATION OF BAY AREA GOVERNMENTS, in INFORMATION REPORT, supra note 332.

334. McCulloch v. Maryland, 4 Wheat. 316, 421 (1819) (dictum); West Virginia ex rel. Dyer v. Sims, 341 U.S. 22 (1951); cf. New York v. New Jersey 256 U.S. 296, 313 (1921); for a fuller discussion of this point see Grad, Federal-State Compact: a New Experiment in Co-operative Federalism, 63 COLUM. L. REV. 825, 834, 840 ff. (1963).

335. United States v. Gerlach Live Stock Co., 339 U.S. 725, 738 (1950).

336. U.S. CONST. art I, § 10.

337. ZIMMERMAN and WENDELL, THE INTERSTATE COMPACT SINCE 1925, at 3-4 (1951).

338. N.Y. UNCONSOL. LAWS § 6401 et seq. (McKinney 1961).

339. Law of Dec. 21, 1928, ch. 42, 45 Stat. 1057 (1928).

340. Ch. 779, 49 Stat. 932 (1935); CONN. GEN. STAT. REV. §§ 25-55, 25-66 (Supp. 1970); N.J. REV. STAT. §§ 32:18-1, 32:18-22 (1968); N.Y. PUB. HEALTH LAW § 1299, art. III(1) (McKinney Supp. 1969).

341. 54 Stat. 748 (1940); MD. ANN. CODE art. 43, § 407 (1965); PA. STAT. tit. 32, § 741 et seq. (1967); VA. CODE § 28.1-203 (1963); W.VA. CODE § 29-1C-1 (1966).

342. CONN. GEN. STAT. REV. § 25-68 (1958); ME. REV. STAT. ANN. tit. 38, § 491 et seq. (1964); N.H. REV. STAT. ANN. § 488:1 et seq. (1968); N.Y. PUB. HEALTH LAW § 1180 (McKinney Supp. 1970-71); R.I. GEN. LAWS ANN. § 46-16-1 (1956); VT. STAT. ANN. tit. 10, § 991 et seq. (1959).

343. Potomac Valley Pollution and Conservation Compact.

344. 54 Stat. 752 (1940); ILL. REV. STAT. ch. 111 1/2, § 117 (1967); IND. ANN. STAT. § 68-601 (1961); KY. REV. STAT. § 224-190 (1969); N.Y. PUB. HEALTH LAW § 1190 (McKinney Supp. 1969-70); OHIO REV. CODE ANN. § 6113.01 (page 1954); PA. STAT. tit. 32, § 816.1 (1949); TENN. CODE ANN. § 70-401 (1955); W.VA. CODE ANN. § 29-1D-1 (1966).

345. The Commission was not confronted with a situation that prompted use of its enforcement power until nine years after its formation. Since 1967 there have been only six cases of formal intervention. E.g., the Terre Haute case, ORSANCO, SECOND ANNUAL REPORT, Appendix A, at 40 (1950); the Gallipolis case, ORSANCO, NINTH ANNUAL REPORT 12 (1957). In the meantime, compliance has been secured informally from hundreds of municipalities and industries. E. J. CLEARY, THE ORSANCO STORY 117 (1967).

346. Pub. L. No. 87-328, 75 Stat. 688 (1961); DEL. CODE ANN. tit. 23, § 901m (1953); N.J. REV. STAT. § 32:11D-1 et seq. (1963); N.Y. CONSERVATION LAW § 801 (McKinney 1967); PA. STAT. tit. 32 § 815.01 (Supp. 1966).

347. ANN. CODE OF MD. art. 96A, § 59 et seq. (Supp. 1969); N.Y. CONSERV. LAW § 835 (McKinney Supp. 1970-71).

348. N.Y. PUB. HEALTH LAW § 1299-m (McKinney Supp. 1969).

349. 81 Stat. 485 (1967), 42 U.S.C. § 1857a (Supp. V, 1965-69).

350. W.VA. CODE § 29-1G-1 et seq. (Supp. 1969).

351. IND. STAT. ANN. §§ 35-4621 et seq. (Burns 1969).

352. N.Y. PUB. HEALTH LAW § 1299, art. III(1) (McKinney Supp. 1969).

353. PENJERDEL AIR POLLUTION CONTROL COMPACT IN REGIONAL CONFERENCE OF ELECTED OFFICIALS, AIR POLLUTION SURVEY REPORT, GOVERNMENT ASPECTS Pt. 3 (Government Studies Center, Fels Institute of Local and State Government, University of Pennsylvania 1968) [hereinafter cited as PENJERDEL]. (The author performed legal analysis and technical assistance in the preparation of the draft compact.)

354. H. Rep. No. 916, 90th Cong., 1st Sess. 1986 (1967).

355. 81 Stat. 485 (1967), 42 U.S.C. § 1857a(c)(2) (Supp. V, 1965-69).

356. Hearings, supra note 32, at 459-66.

357. SENATE COMMITTEE ON PUBLIC WORKS, RECOMMENDATIONS TO THE COMMITTEE ON THE JUDICIARY REGARDING THE CONDITIONAL CONSENT OF THE CONGRESS TO VARIOUS INTER-STATE AIR POLLUTION CONTROL COMPACTS, 90th Cong., 2d Sess. (1968).

358. Hearings, supra note 32.

359. Recommendations, supra note 357, at 3, 4 and Appendix A.

360. Id.

361. H.R. Rep. No. 728, 90th Cong., 1st Sess. 24 (1967).

362. H.R. Rep. No. 728, 90th Cong., 1st Sess. 24 (1967).

363. The Supreme Court has held the contract clause of the Constitution applicable to a state's capacity to legislate with respect to interstate compacts (see West Virginia ex rel. Dyer v. Simms, 341 U.S. 22 (1951); Olin v. Kitzmiller, 259 U.S. 260 (1922); Virginia v. West Virginia, 246 U.S. 565 (1918); Pennsylvania v. Wheeling & Belmont Bridge Co. 54 U.S. (13 How.) 518, 566 (1852); Green v. Biddle, 21 U.S. (8 Wheat.) 1, 13 (1823), and has strongly indicated that the federal government, despite the absence of an explicit Constitutional provision, is similarly restrained (Lynch v. United States, 292 U.S. 571, 579 (1934)). Apart from this restriction, state law would apply both to the state's enabling legislation and laws passed in furtherance of such legislation. (See, generally Grad, supra, note 334 at 848.)

364. Hearings, supra note 32 at 464, 466.

365. Pub. L. No. 87-328, 75 Stat. 688 (1961); N.Y. CONSERV. LAW § 801 (Preamble) (McKinney Supp. 1967).

366. W. VA. CODE ANN. § 29-IG-1-5d (Supp. 1969). The major changes include authorization to the President of the United States to designate a federal representative who can cast the deciding vote if there is a tie (Art. II), to the Interstate Commission to develop and implement air quality standards, carry on monitoring activities, enter on property, and enjoin air pollution which violates standards or causes imminent danger (Art. IV), and a statement that nothing in this compact authorizes a lower level of air quality than those adopted by the commission (Art. VI).

367. PENJERDEL 151, 158.

368. Id. at 159, 160.

369. Id. at 163.

370. MARTIN, BIRKHEAD, BURKHEAD & MUNGER, RIVER BASIN ADMINISTRATION AND THE DELAWARE 132 (1960); Stein, supra note 73, at 167.

371. Grad, supra note 334, at 853; Stein, supra note 73 at 167.

372. Stein, supra note 73, at 167.

373. 81 Stat. 485 (1969), 42 U.S.C. § 1857c-1 (Supp. V, 1965-69).

374. See, e.g., 23 U.S.C. § 103 (1964) and § 103(d) (1)-(3) (Supp. V, 1965-69). See also 49 U.S.C. (1964) generally for additional policy statements and details of administrative organization.

375. 68 Stat. 921 (1954), 42 U.S.C. § 2011 (1964); 78 Stat. 602 (1964), 42 U.S.C. § 2012 (1964).

376. R. CURTIS & E. HOGAN, PERILS OF THE PEACEFUL ATOM 183 (1970), citing a report by J. G. Terrill, Jr. to the American Society of Civil Engineers.

377. Eisenbud, supra note 125; M. Peterson, Environmental Contamination from Nuclear Reactors, 8 SCIENCE AND CITIZEN 1 (1965); Letter from John Gofman to Dr. Janet Karlson, supra note 122; N.Y. Times, March 16, 1970, at 57, col. 1.

378. 33 U.S.C., ch. 12 generally (1964); 82 Stat. 625 (1968), 16 U.S.C. § 1221 et seq. (Supp. V, 1965-69). See p.145, infra for a discussion of the problems of the lack of a constituency and equal sovereignty.

379. CEQ at 37.

380. 78 Stat. 329 (1964), 42 U.S.C. § 1961 et seq. (1964); e.g., 61 Stat. 913 (1947), 30 U.S.C.A. §§ 351-54 (Supp. 1970).

381. "The state governments' attitude toward pollution control parallels that of the Federal Government. A

profusion of conflicting state agencies dealing with these problems is common. Even more common are the lack of effective power and the miniscule budgets." A. Reitze, Jr., supra note 63, at 926.

382. See, e.g., New Jersey v. New York, 283 U.S. 805 (1931), modified, 347 U.S. 995 (1954).

383. E.g., N.Y. CONST. art. IX, §§ 1, 9, 12.

384. E. Rusco, Municipal Home Rule: Guidelines for Idaho 38 et seq. (Bureau of Public Affairs Research, University of Idaho, Res. Mem. No. 1 (1960)).

385. P.117, supra. See also Rosenthal, p. 235, infra.

386. E.g., Ohio River Valley Water Sanitation Compact, art. IV, OHIO REV. CODE ANN. § 6113.01 (1954).

387. DEL. CODE ANN., tit. 23, § 901m (1953).

388. E.g., id.

389. The prime example of this is the New York Port Authority. An interstate compact agency between the states of New York and New Jersey, concerned with many aspects of the movement of goods and people in the metropolitan area, the Port Authority is one of the most affluent governments in the metropolitan area. Its enormous political influence is apparent in the Authority's sponsorship, in the face of major political opposition, of such projects as the World Trade Center. Yet, in spite of the importance of its role, the Authority is not obliged to contribute to the solution of transportation and development problems in the metropolitan area as a whole. The Court of Appeals has held that the Authority does not even owe a duty of disclosure to Congress. Tobin v. U.S., 306 Fed. 270, cert. denied, 371 U.S. 902 (1962).

390. Note, The Air Quality Act of 1967, 54 IOWA L. REV. 115, 135-137 (1968); O'Fallon, Deficiencies in the Air Quality Act of 1967, 33 LAW & CONTEMP. PROB. 275 (1968).

391. E.g., MICH. COMP. LAWS ANN. § 257.707 (1967); N.H. REV. STAT. ANN. § 263:46 (1966).

392. Halliday, supra note 131, at 13, 14.
393. Pub. L. No. 91-190, 83 Stat. 852 (1970).
394. States Loosen Restrictions on Use of Highway Revenues 5 STATE GOVERNMENT NEWS, May, 1970, at 2.
395. E.g., OKLA. STAT., tit. 82, § 932(a), (b) (Supp. 1968).
396. E.g., FLA. STAT. ANN. § 403.011 et seq. (Supp. 1970-71).
397. E. & J. Hanks, An Environmental Bill of Rights: The Citizen Suit and the National Environmental Policy Act of 1969, 24 RUTGERS L. REV. 230 (1970).
398. Pub. L. No. 91-190, tit. II, 83 Stat. 852 (1970).
399. Id. § 202.
400. Id. § 204.
401. COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY (First Annual Report transmitted to Congress August 1970).
402. CF LETTER, April 1970.
403. Id.
404. Section 207 authorized a \$300,000 appropriation for fiscal 1970, \$700,000 for fiscal 1971 and \$1,000,000 for each fiscal year thereafter.
405. Pub. L. No. 91-224, 84 Stat. 91 (1970).
406. See H.R. REP. No. 91-765, 91st Cong., 1st Sess. 9-10 (1969), commenting on the change in the House bill which did not include this language.
407. Pub. L. No. 91-190, § 102, 83 Stat. 853 (1970); Pub. L. No. 89-554, 80 Stat. 383 (1966); Pub. L. No. 90-23, § 1, 81 Stat. 54 (1967), 5 U.S.C. § 552 (Supp. V, 1965-69).
408. Exec. Order No. 11,514 (March 5, 1970).

409. 35 Fed. Reg. 7390 (1970).

410. Hearings Before the Subcomm. on Fisheries and Wildlife Conservation of the House Comm. on Merchant Marine and Fisheries, 91st Cong., 2d Sess. 69 et seq. (1970). As of August 12, 1970, 26 final and 45 draft statements had been received by the Council. Id. at 71.

411. See D. Sive, Some Thoughts of an Environmental Lawyer in the Wilderness of Administrative Law, 70 COLUM. L. REV. 612, 619 et seq. (1970) for a discussion and suggestion for change in the scope of judicial review in environmental cases.

412. See CF LETTER, supra note 402. Soon after the passage of the Act the Army Corps of Engineers held a press conference to announce the formation of an environmental advisory board to carry out the requirements of the Act. N.Y. Times, April 5, 1970, pt. I, at 91.

413. CF LETTER, supra note 402; Allakaket v. Hickel, C.A. No. 706-70 (D.D.C. April 3, 1970); Texas Committee on National Resources v. United States, No. A-69-CA-119 (W.D. Tex., Feb. 5, 1970). The Act had been cited in at least 17 other court cases and 5 administrative proceedings as of August 1, 1970. Hearings Before the Subcomm. on Fisheries and Wildlife Conservation, supra note 410, at 163.

414. Pub. L. No. 91-190, § 101(c), 83 Stat. 852 (1970)

415. H.R. Rep. No. 91-765, 91st Cong., 1st Sess. 8 (1969).

416. E.g., FLA. STAT. ANN. § 403.011 et seq. (Supp. 1970-71); N.Y. ENVIRONMENTAL CONSERVATION LAW (McKinney Supp. 1970).

417. Reorganization Plan No. 3; Reorganization Plan No. 4 of 1970, H. DOC. NO. 91-365, 91st Cong., 2d Sess. (1970).

418. Reorganization Plan No. 2 of 1965, 30 Fed. Reg. 8819 (1965).

419. Reorganization Plan No. 3 of 1970, § 1.

420. Id. § 4.

421. Id. § 2(a).

422. Id. § 2(a)(5), (b).

423. 116 CONG. REC. H6,525 (daily ed. July 9, 1970).

424. E.g., N.J. STAT. ANN §§ 13:10-1 et seq. (Supp. 1970-71).

425. H. Perry, Air Pollution from Powerplants and Its Control, and J. Middleton, Air Conservation and the Protection of Our Natural Resources 101, 166 PROCEEDINGS, NATIONAL CONFERENCE ON AIR POLLUTION (1963).

426. Pollution is a consequence of using a cheap, convenient waste disposal method. The alternative, no longer to treat air and water as free goods, is impressively expensive. Consider that in 1966, for example, the total budget for all governmental air pollution control programs combined was \$20 million; the estimated need was \$72 million. Comment, Equity and the Ecosystem: Can Injunctions Clean the Air?, 68 MICH. L. REV. 1254, 1260 n. 33 (May 1970). The electric power industry, in addition to its air pollution problems, faces the problem of thermal pollution (caused by discharge of water for cooling purposes). The Department of Interior estimates that by 1980 the electric power industry will require about one-sixth of the total available fresh-water runoff in the entire nation for cooling purposes. Remarks by Max Edwards, Assistant Secretary of the Interior for Water Pollution Control, before the Natural Resources and Public Utilities Sections of the annual meeting of the American Bar Association, Philadelphia, Pa., Aug. 6, 1968, at 1. The forecasted building cost for cooling towers to control the consequent thermal pollution over the next five-year period is \$2 billion. The Cost of Clean Water and its Economic Impact, 1 FEDERAL POLLUTION CONTROL ADMINISTRATION, Jan. 10, 1969, at 158. In the more conventional areas of air pollution control, the costs remain equally impressive. A combined mechanical and electrostatic installation (device to catch cinders and fly ash particles) for a 360,000-kilowatt unit, cost about

\$5 million, as early as 1963, representing an investment of about \$14 for each kilowatt of customer demand. These costs do not include research expenditures. Needless to say, costs in 1970 are even higher. Hearings on S. 432, S. 444, S. 1009, S. 1040, S. 1124 and H.R. 6518 Before a Special Subcomm. on Air and Water Pollution of the Senate Comm. on Public Works, 88th Cong., 1st Sess. 373-75 (1963). A discussion of the costliness and difficulties of removing sulfur-bearing compounds from coal or oil may be found in PROCEEDINGS, supra note 425.

Conversely, the costs of pollution are also staggering. The CEQ estimates the economic costs of pollution at billions of dollars annually. Evidence of the damaging effects of air pollution has been accumulating since 1963. Paint deterioration, higher cleaning bills, reduced crop yields, and increased medical bills are some of its costs. On a more long-term basis, major ecological changes may take place, including major climatic changes. CEQ, at 17-18. Gerhardt, Incentives to Air Pollution Control, 33 LAW & CONTEMP. PROB. 358 (1968).

427. Evidence of this contest may be found in the proliferation of cases involving the Federal Power Commission's licensing operations. E.g., Udall v. Federal Power Commission, 387 U.S. 428 (1967); Scenic Hudson Preservation Conference v. Federal Power Commission, 354 F.2d 608 (2d Cir. 1965), cert. denied, 348 U.S. 941 (1966); Federal Power Commission v. Union Electric Co., 381 U.S. 90 (1965).

428. OUR CROWDED PLANET: ESSAYS ON THE PRESSURES OF POPULATION (Osborn ed. 1962); THE POPULATION DILEMMA (Hauser ed. 1963); POPULATION BULLETIN, A SOURCEBOOK ON POPULATION (Nov. 1969) (a bibliography on population problems of every dimension).

429. E.g., N.Y. SESSION LAWS, ch. 127 (1970), amending N.Y. PENAL LAW § 125.05(3) (McKinney 1967).

430. See Hearings on S. 1676 Before the Subcomm. on Foreign Aid Expenditures of the Comm. on Government Operations, 89th Cong., 1st Sess. 2013-86 (1965) (materials on state legislation collected by Sen. Gruening).

431. Presidential Message to Congress on Population Growth, July 18, 1969, 115 CONG. REC. 20,025 (1969).

432. 22 U.S.C. § 2201, authorizes funds for research into population growth in less developed countries. The states' police power--to protect the public health and safety--has long provided the basis for health legislation generally. *Jacobsen v. Massachusetts*, 197 U.S. 11 (1904). Laws regulating the performance of abortions, based on the police power, have recently been subjected to a number of limitations, on due process and other constitutional grounds. *United States v. Vuitch*, 305 F. Supp. 1032 (D.D.C. 1969); *Babbitz v. McCann*, 310 F. Supp. 293 (E.D. WISC. 1970).

433. *Griswold v. Connecticut*, 381 U.S. 479 (1965). The Court held that a Connecticut statute that prohibited the use of contraceptives violated the right of marital privacy, a right found within the "penumbra" of other specific guarantees of the Bill of Rights.

434. The problem which such balancing involves, with its juggling of the "value-need" ratio, is illustrated by the 1968 amendments of the Federal Highway Act in response to pressure from conservationist groups. S. REP. NO. 1340, 90th Cong., 2d Sess. 5 (1968).

435. E.g., fully one-third of San Francisco Bay has already been filled in and developers are asking for more. E. Drew, Dam Outrage: The Story of the Army Engineers, 225 ATLANTIC, April 1970, at 60.

Albert J. Rosenthal

Federal Power to Preserve the Environment: Enforcement and Control Techniques

It is the purpose of this paper to examine various ways in which the federal government can compel or induce compliance with environmental standards. Accordingly, some provocative areas of inquiry, such as those pertaining to the substantive standards to be set or the process by which such decisions are to be made, have not been discussed. Since the focus is the enforcement role of the federal government, it also seems necessary to forego consideration of many interesting questions pertaining to the possible role of private litigation in protecting the environment.¹

Introduction: the Constitutional Power of the Federal Government

It is sometimes said that the constitutional structure of the United States, with only limited powers accorded to the federal government, restricts its ability to act on a nation-wide basis in preserving the environment and requires it to accomplish its goals through enlisting the cooperation of state and local governments.² It is suggested that this nation, unlike those with centralized governments such as Great Britain, is precluded by law from taking the steps needed for an all-out national effort to protect the environment from every challenge. Whatever might have been the prevailing notions one or two generations ago, most students of constitutional law would assert today that this is simply not true. Political considerations calling for restraint in the exercise of federal power may cause a choice to be made, wisely or unwisely, in favor of local programs and local enforcement; it may be that the sheer size and geographical diversity of our country--unlike Great Britain--argue for a large measure of local control as a matter of policy; but such elections should be frankly recognized as resting upon conscious choice and not compelled by any constitutional barrier.

SOURCES OF FEDERAL AUTHORITY

The federal government, unlike the states and most centralized foreign governments, is one of enumerated powers and can act only within the area of its

authority. Yet these powers have been so broadly extended by a succession of Supreme Court decisions that virtually any conceivable measure reasonably intended to protect the environment can readily be sustained under one or more of the grants of authority to Congress. Regulations forbidding or restricting activities that contribute to pollution or otherwise despoil the environment, a wide range of criminal and civil sanctions to ensure adherence to these regulations, and the spending of government funds for research, as well as incentives for desired conduct, are all within the power of the federal government if it chooses to act.

The Commerce Power

Direct federal regulation, including outright prohibition where it is deemed appropriate, of virtually every activity tending to contaminate the environment may be sustained under the federal power over interstate and foreign commerce. Federal authority to forbid water pollution need not be limited to interstate or boundary streams or to navigable waters. Federal authority to protect the quality of the air need not depend on the argument that the movement of contaminating gases or particles is a form of commerce. Pesticides need not be traced across state lines before federal power may be invoked. Solid wastes may remain in the state where they are dumped without conferring immunity from federal control. Congress can act in all of these areas if it sees fit.

The commerce power has been by far the most widely

used--and upheld--regulatory weapon in the congressional arsenal. From its initial definition by John Marshall in Gibbons v. Ogden,³ "commerce" has been given an extremely broad construction and once it is found that interstate commerce is involved, the power of Congress "may be exercised to the utmost extent and acknowledges no limitations other than those prescribed in the Constitution."⁴

Thus, anything which may be properly characterized as "interstate commerce" may be regulated, or indeed forbidden by Congress. But that is not all. The power to regulate or protect interstate commerce extends to include the power to control those things which are not commerce or are purely intrastate commerce, provided that such control is reasonably deemed by Congress to be of assistance in the regulation or fostering of interstate commerce itself.

For example, while the production of goods intended to move in interstate commerce may not, in itself, be deemed "commerce," Congress may regulate the circumstances of that production, including the wages, hours⁵ and labor relations⁶ of those employed in it. Nor need goods move, or even be intended to move, in interstate commerce to be subject to federal regulation. A trivial amount of wheat produced by a small farmer entirely for use on his own farm was held to be an integral part of the supply of a commodity, some of which moves in interstate commerce, and therefore subject to congressional regulation in order to control the interstate price.⁷ Even though the effect of a single person's conduct "may be trivial by itself," Congress

is entitled to consider the total impact of "his contribution taken together with that of many others similarly situated."⁸

Thus, such essentially local activities as the refusal of a restaurant, a motel, or even an amusement area, to serve a black customer have been held subject to proscription, on the basis of the congressional finding that such refusals inhibit the interstate transportation of food, or entertainment equipment, or the interstate movement of travelers.⁹

Moreover, the fact that the power of Congress is sought to promote a social objective unrelated to business is no bar to its exercise.¹⁰ Thus, the Court has upheld the application of the commerce power to prohibit the interstate transportation of lottery tickets.¹¹ It is interesting that in reaching its decision the Court characterized the decision of Congress as one that "such commerce shall not be polluted by the carrying of lottery tickets from one state to another."¹² Other instances of Court-approved use of the commerce power for purposes not related to business include prohibitions of the transportation of persons for purposes of prostitution,¹³ or even amateur immorality,¹⁴ and the interstate transportation of a kidnapped person.¹⁵

In addition, in upholding the federal power over wages and hours in employment, the Court in United States v. Darby¹⁶ sustained prohibition of interstate transportation of goods manufactured through use of labor employed contrary to the federal standards, and, as a means of implementing this, Congress was

permitted to forbid their manufacture as well.¹⁷ The Court has therefore, it would seem, drawn up the blueprint for almost any exercise of congressional power. Something--anything--is prohibited from movement in interstate commerce, and then to make this prohibition effective, that something cannot be produced at all.

Therefore, if Congress wishes to forbid a manufacturing process which pollutes the air or the water, or the manufacture of a product which itself will be damaging--e.g., detergents containing phosphates--it may forbid the movement in interstate commerce of the product and then to implement this prohibition forbid its manufacture as well. Indeed, the power of Congress to forbid the manufacture need not rest upon its exercise of the power to forbid the interstate movement; if the manufacture itself may affect interstate commerce, it may be regulated or prohibited even though Congress elects not to forbid interstate transportation of the product.¹⁸

Alternatively, Congress can, after appropriate hearings, reach the factual conclusion that air pollution, or water pollution (even of intrastate, non-navigable, streams), hurts interstate commerce by injuring crops, farm animals or fish, impeding aerial or possibly even surface transportation, discouraging travel for employment or recreation, etc. On the basis that even the acts of one small polluter, whose effluence alone would be insignificant, looms large when taken in conjunction with those of thousands of others, a rationale for total control may be readily put forward.¹⁹

In many situations there are alternate grounds for congressional exercise of the commerce power to control the waterways or the airways as highways for commerce.²⁰ If it were necessary, arguments could be made that not only interstate waterways, but even intrastate navigable waterways used or susceptible of use by interstate commerce, fall within the regulatory power of Congress.²¹ Alternatively, it might be asserted that the pollutants themselves were articles in commerce, the movement of which could be regulated.²² These approaches might, however, fail to provide a basis for regulation of pollution of a non-navigable, purely intrastate body of water;²³ while every river reputedly finds its way into the sea, there must be some lakes, and streams feeding lakes, the entire systems of which are entirely within the borders of a single state.

The air, of course, is subject to no such confining process and it must be assumed that every molecule ultimately finds its way to every part of the world.²⁴ Hence, if particles or gases emitted into the air are regarded as themselves articles of commerce, there would be no doubt of their inclusion in interstate streams of air; their movement, as air pollutants, across a state line would constitute interstate commerce. Even offensive odors have been held to be air pollution moving in interstate commerce.²⁵ Alternatively, if visibility is affected by concentrations of particles, or possibly gases, even if they did not cross a state line, their interference with interstate air navigation would seem to be a sufficient basis for federal control.²⁶ But again,

there are other grounds for asserting federal control, suggested above, falling much more closely within established constitutional doctrines.

The Power to Tax and Spend

The power to spend money is an important device available to Congress for accomplishing many purposes. Some of its possible uses for purposes of protecting the environment will be explored below. Expenditures generally do not give rise to constitutional issues, at least in the absence of a violation of one of the negative commands of the Constitution such as that forbidding the establishment of religion. The spending power may be used only for the "general welfare,"²⁷ as distinguished from narrower purposes, but it is difficult to believe that the protection of the national environment would not be sufficiently general to pass any test, even assuming that there were a litigant with standing to challenge the expenditure.²⁸ After all, the environment is the epitome of what is "general."

The taxing power is equally broad, and except for a few limitations not here pertinent, may be regarded as substantially untrammelled.²⁹ If a tax is primarily a camouflaged regulation rather than a revenue-raising measure, there is still little likelihood of successful challenge to it. First of all, the Supreme Court has been extremely willing to adopt the characterization given by Congress and accept the tax at face value.³⁰ But if, in a rare case, the Court regarded the "tax" as not a revenue measure at all but a purely regulatory one, it would still uphold

it if it could be sustained under one of Congress' regulatory powers--for example, its power over interstate commerce.³¹

These considerations are pertinent when the question of the effluent charge³² is raised. This is a suggested device, discussed below, whereby a polluter (generally of water) is taxed an amount measured by the cost of cleaning up the quantity and type of effluent he emits, with the proceeds used for such treatment operations. Whether the charge be regarded as a revenue-raising measure, or more like a protective tariff aimed at discouraging rather than raising money, it nevertheless would stand up. If the charge is part of a scheme, modeled perhaps on that in use in the Ruhr Valley in Germany,³³ of earmarking money taken from polluters for financing the processes of purification, a possible attack might be made on the basis of United States v. Butler,³⁴ but it may be confidently predicted that the Court would uphold the plan.

In Butler, a tax on processors of certain agricultural products was specifically earmarked for payments to the farmers who had grown the crops. The Court, during the high water period of judicial invalidation of New Deal economic measures, held that the processor had standing to attack the tax imposed on himself, and could then bring into question the entire scheme; since the awarding of benefits to farmers was intended to purchase adherence to a regulatory scheme then regarded as beyond the powers of Congress, the Court invalidated the entire program. Subsequent decisions cast doubt upon the continued force of this precedent,³⁵ but in any event

at least two distinctions would make it inapplicable to the effluent charge: (1) The proposal does not involve any buying of cooperation; and (2) the entire program could be sustained independently under the commerce power, which at the time of the Butler decision was not deemed sufficient to uphold the agricultural program there involved.³⁶

The Treaty Power

If these grants of power are not sufficient, there are still further grounds for federal authority in the area. Under the treaty power, for example, the President can enter into an agreement with another nation whereby both agree to engage in or refrain from designated conduct; thereafter, Congress can implement this treaty through legislation which in the absence of the treaty it might not have had the power to enact.³⁷ For example, an attempt by Congress in 1913 to legislate protection over migratory birds had been held unconstitutional by two lower courts, which did not deem the commerce power to be applicable.³⁸ (It is doubtful whether that result would be reached today.) In 1916, the President, with the consent of two-thirds of the Senate, then entered into a treaty³⁹ with Great Britain⁴⁰ providing for mutual protection of the birds by the United States and Canada. Following this, Congress in 1918 enacted legislation forbidding the killing, capture or sale of such birds. Assuming arguendo that such legislation would not have been within the power of Congress in the absence of the treaty, in Missouri v. Holland⁴¹ the Court nevertheless upheld it as an implementation of the treaty.

Thus the United States could enter into a treaty with Canada whereby both nations agreed not to pollute the air or the water.⁴² Especially between neighboring countries, there would be no problem as to the validity of such a treaty. To the extent that air pollution crossed the international boundary, the mutual interest of the two nations would be clear, and it may be assumed that even though prevailing winds are generally from West to East there is a sufficient possibility of North-South movement to sustain any implementation deemed desirable by Congress. Even as to the pollution of waters which do not serve as or move across international boundaries, the effect on the total continental ecology (through killing of wildlife, etc.) would appear ample to sustain similar broad legislation.

But the validity of such a treaty or of legislation intended to implement it would not seem to depend on the proximity of the signatory nations; protection of the environment would seem to be a most appropriate subject for international agreement.⁴³ Doubts as to validity would arise only if the use of the treaty power were a clear subterfuge intended to permit Congress to do something which it could not otherwise do. If, for example, we entered into a water pollution treaty with a remote nation with which we had virtually no physical or commercial relationship or interest--e.g., Vietnam?--the treaty might be deemed so flagrant an attempt to raise the federal power by its own bootstraps as to be treated as nugatory.⁴⁴ In such an improbable event, federal power would

have to rest upon some other basis; even so, there would seem to be no difficulty.⁴⁵

POSSIBLE LIMITATIONS

Thus far we have discussed the affirmative bases for federal authority, without considering such limitations as there may be upon a grant of authority which is applicable prima facie but might nevertheless run afoul of some other constitutional prohibition. By way of analogy, Congress can certainly regulate interstate railroads, but it could not forbid Democrats to travel on them.

Just Compensation

The Fifth Amendment proscribes the taking of private property for public use except upon payment of just compensation. Presumably, the argument can be made in some states that one who owns land abutting a stream has certain "property" rights incidental to it, which may be regarded traditionally as including the right to dump waste products into the stream; under the law of other states, analogous claims may be based upon "appropriation" of water through prior use of it. A large body of law has evolved concerning rights to discharge wastes into waterways, the relative positions of upstream and downstream users, the development of prescriptive rights and the doctrines of appropriation and res communes.⁴⁶ But all of these asserted rights, if they can be elevated to the status of "property" at all,⁴⁷ are presumably subject to the police power of the appropriate state or local

government⁴⁸ and its analogue, the regulatory power of the federal government.⁴⁹ Certainly, as to navigable waterways the authorities appear clear that the property rights of abutting owners are subject to federal regulation.⁵⁰ And to the degree that the federal power may extend to non-navigable intrastate waters as well, the same reasoning could also subordinate any asserted property right to such regulatory authority.

The police power--meaning, in effect, the right of government to legislate in the public interest⁵¹--when used for a legitimate purpose has frequently tended to qualify otherwise existing property rights.⁵² "Most regulations of business necessarily impose financial burdens on the enterprise for which no compensation is paid. These are part of the cost of our civilization."⁵³

Air and water pollution may properly be characterized as a nuisance; if there is a property right to continue to commit such a nuisance, it is certainly subject to legislative abridgement, without compensation, in the interest of the public welfare.⁵⁴ Indeed, a state may, if it wishes, destroy one industry if it finds it essential in order to protect another.⁵⁵ The federal government, wherever one of its grants of power gives it reach, may do much the same things as the states may under their more generalized police power.⁵⁶

Even more clearly, there is no "property right" to pollute the air. While the property owner was once thought to have rights to the air above his land up to the heavens, this is very much qualified by the

right of aircraft to traverse his air space⁵⁷ and, moreover, would not necessarily include the right to emit particles or gases which would quickly pass into the air space over someone else's property.⁵⁸

While the dividing line between valid regulation under the police power or other grants of legislative authority on the one hand, and a taking of private property for public use for which the Constitution requires compensation, is not easily defined,⁵⁹ regulation of pollution would seem to fall clearly within the area where compensation is not required.

Due Process of Law

Federal legislation, even if enacted pursuant to a constitutional grant of authority, must still be consistent with the prohibition against taking life, liberty or property without due process of law, found in the Fifth Amendment. From a procedural standpoint, this may require that the proceedings of regulatory or other administrative agencies meet standards of basic fairness.

At an earlier period of constitutional interpretation, the due process clause was also used to strike down legislation on the ground that it was substantively unfair or unreasonable.⁶⁰ The Supreme Court has, in recent years, veered away from this approach;⁶¹ there have been almost no instances in which the Court has invalidated either federal or state legislation on grounds of substantive due process,⁶² and apparently none at all in cases of economic regulation.⁶³ The

types of environmental control measures currently in contemplation could scarcely be regarded as likely to give rise to serious objections on substantive due process grounds, even assuming the present vitality of the doctrine.

It is possible, however, to conceive of a later era, in which the environmental situation has become so critical that much more drastic measures, sharply curtailing individual liberty, are seriously contemplated; in such a case constitutional problems might indeed arise. If, for example, no satisfactory answer to environmental problems can be found so long as population continues to grow at its present pace, we are likely to consider elimination of tax exemptions for children after the second, or third. If that fails to reduce the birth rate to a sufficient degree, the next step might be the imposition of an additional tax upon the more fecund, and, ultimately, suggestions for limitations upon the number of babies a couple is permitted to have, compulsory contraception, or the eventual proposal that parents of two or more children be sterilized.⁶⁴ If and when that issue comes to the fore, there will undoubtedly be a serious debate as to the constitutional, as well as the ethical, religious, and practical overtones of this kind of emission control; however, it would seem premature to explore it at this time.⁶⁵

Political Limitations

Much more significant than the limitations imposed by the Constitution in a legal, judicially enforced,

sense are the practical political factors which have thus far restricted the federal role in the protection of the environment and may be expected to have a restraining influence in at least the near future. As pointed out by Professor Wechsler: "National action has always been regarded as exceptional in our polity, an intrusion to be justified by some necessity, the special rather than the ordinary caseThe tradition plainly serves the values of our federalism insofar as it maintains a burden of persuasion on those favoring national intervention."⁶⁶

We have undoubtedly reached the point at which, in the judgment of many students of environment, that burden has been met and need for a much larger federal role has become manifest. Even so, there are serious doubts whether in a nation as vast as ours, complete centralization of control over environmental protection would be wise, even if it were politically feasible.⁶⁷

Caution as to Preemption

Congressional action under a grant of power such as the commerce clause may displace state law, under the Supremacy Clause of the Constitution.⁶⁸ Frequently, however, Congress prefers to permit all or certain kinds of state regulation to coexist with its own requirements. If it expresses its intention to preempt or not to preempt with sufficient clarity, its expression should be decisive. But federal laws are often less than clear in this respect, and the courts are left with the difficult task of ascertaining the "intention" of Congress on questions which it had probably not considered.

Until recently, federal statutes on water and air pollution expressly left large areas of responsibility to the states.⁶⁹ With the apparently inevitable increased assumption of responsibility by the federal government in these fields, however, questions of how much authority is left to the state and local governments will have to be faced. Where state regulations are more permissive than federal, there should, of course, be no difficulty in striking them down. But when a state seeks to insist on standards of environmental protection more stringent than those imposed by federal authority, decisions will have to be reached as to whether the interest in having a single comprehensive plan and in achieving nationwide uniformity of regulation is sufficiently great to justify forbidding the state from so acting.⁷⁰

Congress will, therefore, probably have to give more attention in the future to avoiding the unwitting exercise of its power in such fashion as to strike down under the Supremacy Clause state laws intended to protect the environment.

* * * *

Assuming, therefore, almost plenary power in the federal government to legislate for the protection of the environment, we must turn to the techniques which can be used to accomplish this purpose, the various carrots and sticks available to induce or compel compliance with the government's decisions in this area.

It should be recognized at the outset that good intentions will not be sufficient to save the environment.

Pollution will not be ended through individual housewives rejecting detergents containing phosphates, college students refusing to buy beer in throwaway cans, motorists insisting on lead-free gasoline. Nor is any major contribution to the solution likely to be found in voluntary measures on the part of public-spirited business concerns. In most situations, under current rules of the game, it pays to pollute, and the company that increases its expenses substantially to avoid doing so will generally find itself at a competitive disadvantage; on the other hand, if all competing firms were subjected to the same regulations, all would have an incentive to comply, especially if we succeed in making it sufficiently expensive to harm the environment, or sufficiently cheap to preserve it, or a combination of both.

Direct Regulation

TYPES OF SANCTION

Thus far we have had only a trickle of enforcement, as contrasted with torrents of pollution. While no devices to compel compliance can succeed in the absence of a national commitment to save the environment, there is reason to hope that such a commitment may be forthcoming; it is therefore important to explore ways in which it can be turned to most effective use.

The most obvious way to discourage any kind of conduct deemed undesirable is to prohibit it and to

make it painful for anyone who violates the prohibition. There are a number of traditional legal devices which can be used for this purpose.⁷¹ When sought to be applied in cases of damage to the environment, however, some of these sanctions may not work well.

Criminal Prosecution

Perhaps the most direct sanction is to make violation a crime. Despite the emphasis in state anti-pollution legislation on criminal, as opposed to other types of sanction,⁷² criminal prosecutions have seldom been used effectively in the enforcement of environmental protection laws. There are several possible explanations.

First of all, if anything more than a small fine (analogous to that given for a parking violation) is to be imposed, tradition,⁷³ perhaps reinforced by a constitutional mandate,⁷⁴ may require that there be a showing of some kind of mens rea. To impose a substantial prison term, willfulness, or at least negligence, would probably have to be proved beyond a reasonable doubt.⁷⁵ Since the most important polluters are likely to be large business concerns, it will often be impossible to prove the personal culpability of individual officers or employees. (Corporations can, of course, be fined but can scarcely be imprisoned.) And in a criminal prosecution, the government will have to prove its case beyond a reasonable doubt, and because of the privilege against self-incrimination it may have to do so without the benefits of discovery of information known to the defendant; moreover, if it loses in the trial court, it may not appeal.⁷⁶

There is also the difficulty of establishing a level of punishment which will be effective. One may well doubt the effectiveness of our criminal law as a whole, as well as find difficulty in evaluating its actual deterrent effect. But at least where there is a strong public revulsion toward the offense and the offender, there can generally be a wider range of punishment which may be severe enough to have whatever deterrent value punishments ever have and yet not be so harsh as to deter a judge from imposing them or a jury from convicting.

This degree of latitude may not be available, however, where criminal sanctions for pollution are concerned. It is doubtful that public opinion has yet reached the point, in spite of rapidly growing interest in the protection of the environment, that one who murders a lake would be regarded as comparably culpable to one who murders a person.⁷⁷ At the other end of the spectrum is the fact that small fines⁷⁸ simply will not deter large corporations. It is quite clear, for example, that the attempts by Consolidated Edison to reduce its pollution of New York City's atmosphere have not been the result of the occasional \$25 or \$100 fines imposed upon it.⁷⁹

As long as the context appears to the public to be a commercial one, and the net damage done by any one act on the part of one polluter is not clearly discernible, the situation may continue to resemble that which has obtained in connection with enforcement of the anti-trust laws. In that area, the criminal sanction has played a negligible part,⁸⁰ while the injunction, the

divestment order and the private treble damage action have all been of much greater significance.⁸¹

Civil Penalties

The imposition of monetary penalties in a non-criminal proceeding may be an effective substitute for a prosecution⁸² if the latter is merely for the sake of levying a fine. Such penalties may have substantial deterrent value, particularly if they can be imposed administratively.⁸³ The National Air Quality Standards Act of 1970, if enacted in the form in which it passed the Senate, would provide for civil penalties of up to \$10,000 per day, as well as criminal penalties of up to \$25,000 per day⁸⁴--sums large enough to give even major corporations considerable pause. Much can also be said for the technique, previously proposed in a different context,⁸⁵ of establishing mandatory cumulative penalties as a means of providing a reasonable and credible sanction.

There is fairly clear authority for the characterization of such penalties as civil. This characterization would allow them to be imposed without the usual safeguards in criminal proceedings, such as trial by jury and proof beyond a reasonable doubt.⁸⁶ Nevertheless, there can never be assurance that a sanction so nearly criminal in all but name will not be so regarded by the courts.⁸⁷

Injunctions

The most effective remedy against a business concern violating a law, and certainly the most widely used,

is the injunction. As a civil remedy it may be granted upon a mere preponderance of the evidence, and although scienter or willfulness may be relevant,⁸⁸ neither should be a prerequisite to relief from environmental wrongs. While there may, on the one hand, be one or possibly two levels of appeal, on the other hand a temporary restraining order is also possible, as well as a preliminary injunction. If a stay pending appeal is refused, the questioned practices may be brought to an immediate halt.

There is some doubt, however, whether courts will grant such immediate relief when the practice sought to be enjoined is one which has been going on for years and the enforcement attempt is directed toward improvement in the quality of the environment.⁸⁹ There is obvious tension between the possibility of immediate injunctive relief, before trial or even ex parte, and the practice of granting stays of injunctions pending appeal. It may be resolved on the basis of whether the relief sought is against a long-standing abuse, such as the continued pollution of a river, or a projected new affront, such as the dramatic and irreversible desecration of a mountain. Courts are more likely to interpose an immediate barrier to a new rape than they are to a long-continued defilement.⁹⁰ Even greater difficulty in achieving quick injunctive relief will probably be encountered if the defendant can show the prospect of serious loss, and perhaps a sharp curtailment of employment in the affected plant.⁹¹

One would at least hope, however, that enforcement authorities will be permitted to institute injunction

proceedings as quickly as possible. A recent threat to start an action against the Penn Central Railroad if after six months it was continuing to pollute the Hudson River⁹² seems startling; if six months is a reasonable period in which correction may be completed, it would appear appropriate to sue immediately and ask that the court order compel the defendant to eliminate the offending practice within six months.⁹³ Similarly, the shocking delay of about five years from the time of institution of charges to final effectiveness of a court order in the single federal air pollution case brought to judgment⁹⁴ suggests that serious attention must be given to the time factor as a major determinant of the effectiveness of the sanction.

There is therefore substantial likelihood that if the injunction is to be the principal weapon relied upon, polluters may find it economically advantageous to give no more than lip service toward correction and to keep on polluting until the last order of the last court is finally affirmed and rehearing denied. Procedures calling for protracted conferences and consultations before litigation may commence⁹⁵ must be modified *in the interest of speed*. If this is done, the injunction can become a truly effective enforcement technique.

Actions for Damages

The civil action for damages sometimes serves as an effective enforcement device. An action for damages brought by the federal government might run into difficulties in establishing what monetary damage the government itself--as distinguished from its citizens--

had suffered. In many cases, it might be difficult to prove this to have been substantial. Another approach might be to permit the government to recover for all damage inflicted upon private persons except to the extent that the private persons themselves brought suit. An analogue might be found in the Emergency Price Control Act of 1942,⁹⁶ which permitted the government to recover up to treble damages in cases of sales above maximum price levels. Where the sale was for use in trade or business the government's right was immediate; where it was to a private consumer the government could sue only if the consumer failed to bring suit within a specified period. Courts at the time were divided on the question of whether such treble damage actions by the government were to be characterized as "remedial" or "penal,"⁹⁷ but there was ultimately no dispute that what was involved was a civil action and that the special requirements imposed in criminal prosecutions were not applicable.⁹⁸

Even assuming creation of a sanction of this kind, there still remains the problem of proof of damage. When under the price control laws a seller charged \$2,000 for an automobile whose ceiling price was \$1,700, there was no difficulty in computing single damages of \$300 and hence treble damages of \$900. How does one measure, however, the harm done to the inhabitants of New York City, or of other downwind areas, coming from a power plant whose stacks gush sulfur dioxide or noxious particles, an automobile emitting hydrocarbons or carbon monoxide, or an apartment house incinerator casting up large quantities of

soot? Assuming that such legislation can affirmatively create causes of action for pollution-caused injuries, the problems of proof of causation and damages remain extremely difficult.⁹⁹ The civil penalty, on the other hand, may be imposed without such proof; in most instances it would be a far more effective remedy, requiring only a showing that the prohibited acts had occurred or that prescribed acts had been omitted.

Licensing

Another possible device for enforcement would be a program of licensing of businesses, with a forfeiture of license to be imposed upon violation of regulations or perhaps upon a second violation after one warning. Across the board licensing was employed by the Office of Price Administration pursuant to an authorization in the Emergency Price Control Act of 1942;¹⁰⁰ all sellers were declared subject to licensing, all were automatically given a license, and licenses were to be suspended for up to a year upon a second offense.¹⁰¹ This device was not used with any frequency as a mechanism for controlling prices, and was presumably not thought to be as effective as the civil and criminal penalties also available.¹⁰² Its very harshness probably tended to make the sanction unpalatable to the regulators and rendered the threat incredible to the regulated. Moreover, loss of a needed facility such as a power plant, or the economic fall-out from closing down a major industrial establishment, would in many cases be so great as to discourage any effort to invoke such a power.

Nevertheless, isolated instances of closedown to meet the growing environmental crisis can be found¹⁰³ (although not in a licensing context), and such action may be a barometer of a changing public climate and judicial response. The licensing device with its suspension features may find favor as the crisis deepens.¹⁰⁴

Seizure and Forfeiture

Another technique available to the federal government is to take possession of an offending plant and operate it in such fashion as to comply with environmental law. Seizure of property in the public interest has occasionally been employed, most notably in order to compel continued production despite a strike.¹⁰⁵ The same approach could be followed in the case of a particularly flagrant polluter, with the government taking over the plant, correcting the offending process, and then returning the plant, with the question of compensation deferred for later litigation in the Court of Claims.¹⁰⁶ To the extent that production could be continued during the changeover, it would be possible to avoid the community resentment which follows upon loss of jobs.

A more drastic form of seizure would be the forfeiture of the offending plant to the government, with no compensation and no return. Laws exist, authorizing forfeiture of property used in committing certain kinds of violations:¹⁰⁷ boats employed in smuggling, automobiles used in the dope traffic, distilleries violating the alcohol tax laws, all are subject to seizure under

such statutes.¹⁰⁸ Since forfeiture is considered a drastic remedy, not favored by the courts, the cases have tended to construe such statutes strictly.¹⁰⁹

Similar powers are authorized in the Sherman Act,¹¹⁰ but apparently have never been utilized.¹¹¹ Judge Taft (in the only case to consider this provision)¹¹² interpreted the Sherman Act provisions to mean that antitrust forfeiture proceedings should follow the procedures used under the revenue laws.¹¹³

Safeguards required in criminal cases may not be applicable in forfeiture proceedings. In The Palmyra,¹¹⁴ the Supreme Court stated that "The thing is here primarily considered as the offender, or rather the offence is attached primarily to the thing. . ." and in Dobbins¹¹⁵ it said: "Nothing can be plainer in legal decision than the proposition that the offence therein defined is attached primarily to the distillery. . .without any regard whatsoever to the personal misconduct or responsibility of the owner. . ."

Thus, the forfeiture proceeding has traditionally been regarded as a civil proceeding in rem rather than criminal. Its basis is grounded in the primitive anthropomorphic notion of endowing objects with personality and attributing responsibility to them.¹¹⁶ Certainly, an environmental offense might then be said to attach to the factory or plant and, conceivably, forfeiture might be invoked by the government, which would take it over with no constitutional obligation to compensate the owners.¹¹⁷ The burden of managing such a plant might not be one easily assumed by the government, although such responsibility has been

accepted from time to time, as in the seizure of alien enemy property in wartime.¹¹⁸ Thus, forfeiture would serve as a serious threat hanging over the heads of polluting companies (perhaps augmented by officers' and directors' fear of stockholders' actions), but would not result in the loss of the plant's economic contribution to the community.

There is doubt, however, whether the characterization of forfeiture cases as civil actions in rem automatically insulates them from at least some of the constitutional safeguards with which criminal proceedings are invested.¹¹⁹ Further refinements in their characterization may be expected.¹²⁰

POINT OF APPLICATION

Apart from the question of the kind of sanction to be employed, there are a wide range of possible stages at which they might be applied. The question of the point at which to concentrate enforcement is closely related, of course, to the question of what aspects of the problem are best subject to regulation. This paper is concerned with the latter only to the extent that it relates to the former.

For example, while prohibition of emission of certain matter into the air or the water is one way to curtail it, it is not the only way. Regulation, together with enforcement sanctions, may in some circumstances be applied at an earlier stage of a process. For example, control of the sulfur content of fuel oil used in power production has been employed effectively to reduce the emission of sulfur oxides into the atmosphere

in New York City¹²¹ and elsewhere. Where such a "toll gate" on the stream of pollution is available, proof of non-compliance is comparatively easy, and almost any of the criminal or civil sanctions referred to above might well prove effective. Sanctions against actual emissions do not have to be dropped--the two techniques are not mutually exclusive--but a limited enforcement budget may well go many times as far if there is available a "pressure point" of this sort toward which they can be directed.

As a substantive matter, it is of course most desirable that regulations offer the potential polluter the widest possible range of choices of methods by which to avoid damaging the environment, allowing him to reach the decision most in accordance with his own self-interest and therefore presumably least wasteful economically.¹²² This principle probably has to be sacrificed, however, in some situations where limited enforcement budgets dictate the application of controls at those points in the process at which enforcement is most feasible and least expensive. Ideally, regulatory decisions should be made first without regard to enforcement problems and the enforcement techniques only then applied to ensure their application. At times, however, it may be necessary to consider the ease or difficulty of enforcement as a relevant factor in shaping the regulatory technique.

Where the source of pollution is not a manufacturing process but a manufactured product, there is again the possibility of control of what is manufactured as an addition or an alternative to control over the use of

the product. For example, it seems easier to prohibit the manufacture of detergents containing phosphates than to forbid housewives to use them or to require municipalities to install sewage treatment plants to control their effects.

Several such techniques are available in connection with the automobile. Regulation of the design of newly manufactured cars to reduce their pollution of the air affords a partial solution. But since cars that start clean may become dirty and since there are well over 80 million old cars already on the highways,¹²³ enforcement at the manufacturing level obviously provides no complete answer. Nevertheless, in conjunction with other techniques,¹²⁴ it may contribute toward a solution.

Again, control over the fuels used in automobiles--for example, forbidding gasoline containing lead--might further help reduce automobile pollution. In drawing up regulations, the technology of both the fuel and the engines would have to be considered. Once decisions were made, however, it might be possible to enforce them by applying sanctions to violations in the manufacture or sale of forbidden fuels; in the manufacture, sale or use of automobiles with forbidden engine design; in the use of an automobile violating emission standards; or in a combination of several of these.

A range of possible enforcement devices is available in connection with the problems created by packaging materials. Paper wrappings or metal, glass or plastic containers which are not returnable could be forbidden

or, to the extent that technological developments permit, those which are not rapidly degradable could be barred. The prohibition could be applied to their use at the source, to their transportation in interstate commerce, or (probably less effectively) over the disposition of the product by the last user. Such materials are a primary source of solid waste, but since they are also often disposed of in air or water, they give rise to other types of pollution as well. Industry-wide prohibitions might diminish the reluctance, for competitive reasons, of a single manufacturer to eschew harmful packaging materials; for example, soft drink and beer companies might cheerfully abandon throwaway cans and bottles if their competitors were obliged to do the same.¹²⁵

Perhaps this approach need not be limited to packaging or fuel controls. In some circumstances, regulation of all of the materials used or processes employed in an entire activity, such as a manufacturing operation or the generation of power, might afford the best, or possibly even the only effective method of minimizing environmental damage.¹²⁶

The classical technique of federal regulation is to forbid the movement of objectionable items in interstate commerce. This could be applied to those goods whose inherent properties are not objectionable, but whose process of manufacture causes damage. It could also include goods which could be expected to do harm at a later stage--such as the throwaway beer bottle or the automobile which could be expected to pollute the atmosphere.¹²⁷

The most obvious point of impact in most instances, however, is likely to be the emission of pollutants themselves. This is a difficult and expensive area to monitor and it may not be easy to ascertain what effect the individual polluter may have upon the total character of the air quality region or watershed. Thus, where the nature of the problem is such that other points of application are feasible, they should be given serious consideration. There will probably remain, however, a large number of situations in which control over emissions will be the only effective mode of enforcement.

Subsidies, Incentives and Charges

GRANTS

While federal enforcement efforts are still limited, the principal contribution of the federal government has been the granting of money to finance pollution treatment¹²⁸ and the use of its fiscal resources, rather than its regulatory power, to prod the nation in the direction it wishes it to move.¹²⁹

The most frequent form of these grants is to governmental bodies, state and local, for construction, control and research--in particular, the award of money for municipal sewage treatment plants and similar devices.¹³⁰ Grants may be conditioned on compliance with federal standards. Funds made available on a matching basis¹³¹ reduce the net cost to the recipient governmental

authority. They also strengthen the hand of those favoring construction of the plants, not only in making them less expensive, but also in permitting use of the argument that these attractive federal funds are ready and waiting and should not be allowed to remain unused or, worse still, go to another community.

Grants may also be made directly to private enterprise¹³² in order to assist in the purchase or construction of facilities to reduce their pollution.¹³³ In most cases, economies of scale would make preferable the awarding of grants to public authorities rather than to private polluters in the same area. This factor may be pertinent in connection with water pollution and solid waste disposal, but it is unlikely to have any relevance to the air pollution problem.

Giving grants to private concerns to encourage them to cure their own damaging processes raises many other problems. If a finite amount of money is to do the most good, presumably it has to be used to encourage future improvement rather than to reward past accomplishments. Yet, this tends to give a seemingly unfair advantage to the recalcitrant company which has resisted public demands that it cease polluting and to penalize the public-minded company which expended large sums of money to correct its processes before it was either legally compelled or offered any bribes to do so.¹³⁴ More important, there is serious doubt as to the desirability of having the public finance the cost of correcting the effluence of industrial polluters.¹³⁵ Presumptively, such costs should be borne by the users of the products which give rise

to them, although there may be instances when it would be appropriate for the public as a whole to bear part or all of these expenses.

A possible use of subsidies in the private sector which might be less vulnerable to the foregoing objections would be the granting of incentives to concerns which could reclaim the waste products of others but only at a loss. If the cost would be less than that involved in any other satisfactory method of disposal, such a subsidy might be justified. At the same time, government-sponsored research might find ways in which the reclamation process could be made profitable and the subsidies discontinued.¹³⁶

There may well be some plants which cannot be made to conform to reasonable environmental standards at any economically feasible price. As previously shown,¹³⁷ it is not believed that there is any Constitutional requirement to compensate such enterprises for putting them out of business. Nevertheless, there may be valid arguments for taking over such plants, compensating the owners and providing for generous termination pay, retraining programs, or both, for the displaced employees. It will probably be found that for a somewhat smaller expenditure, most plants can be made to produce cleanly or if necessary be converted into a different type of operation, either under the same ownership and management or pursuant to a government takeover.

TAX WRITE-OFFS AND CREDITS

An indirect form of subsidy which has proliferated

in recent years due to its political attractiveness is the awarding of favorable tax treatment. While the impact of the various forms of taxation imposed by state and local governments¹³⁸ upon business enterprises is usually insufficient to play a major part in business planning or, certainly, to induce construction of what would otherwise be an uneconomical pollution control apparatus, the large federal corporate income tax (or in cases of individual or partnership enterprises, personal income tax) is of an entirely different dimension.

But such plans as are advanced, as well as those already in effect, offer only modest incentives. The principal forms of tax assistance are either an "investment credit" of the order of seven per cent¹³⁹ or a provision for accelerating depreciation.¹⁴⁰ The former would be pleasant to receive, but will only in rare cases be decisive in the arrival at a business decision.¹⁴¹ Accelerated depreciation, theoretically at least, means no more than deferment of the time when part of a tax obligation is due, rather than complete elimination of it. This is the equivalent of an interest-free loan for the amount of tax deferred over the period of deferment, but, again, it is not too likely to serve as a major incentive. If, through sale or otherwise, the deferred tax may be ultimately avoided entirely or reflected only in a capital gain, the value of the device is augmented for the taxpayer, but it still may not, except in rare cases, induce action which would not be forthcoming anyway.¹⁴²

Moreover, tax relief is a most inefficient way of

giving subsidies.¹⁴³ The expertise necessary for careful tailoring of incentives to induce the precise action needed is far less likely to be found in the Senate Finance Committee, the House Ways and Means Committee or the Internal Revenue Service than in the Congressional committees and agencies of the Executive Branch that have been directly concerned with the substantive problem. Less, rather than more, efficient programs may be encouraged. Many concerns will undoubtedly secure tax relief for action they would have taken in any event. And the value of the benefit will be proportionate to the company's marginal tax bracket, a seemingly irrelevant factor. To a company operating at a loss a deduction or tax credit may be completely worthless; yet, some polluters most in need of financial assistance may be in just this category.

The device, as a whole, appears quite unlikely to secure the maximum benefit to the environment from the minimum number of dollars. The only argument in favor of it is that, through concealment of its true nature, a subsidy through tax relief is often politically more saleable than an unmasked device.¹⁴⁴

LOANS

Government loans may be a helpful device to encourage businesses to expend funds to control their pollution.¹⁴⁵ If the company's credit were such that it had ready access to capital markets, such a program would add nothing, unless the government were willing to offer lower interest rates; in that case, what we

would have is little more than another form of subsidy, measured by the interest differential. Where, however, the company does have difficulty securing private financing, government loans would be useful in filling this vacuum. The loan programs of the Small Business Administration,¹⁴⁶ the Export-Import Bank,¹⁴⁷ and other government agencies,¹⁴⁸ make use of a small portion of the vast power of the federal government to accumulate and disseminate funds for purposes regarded as socially useful.

RESEARCH PROGRAMS

Much of the federal air and water quality legislation has authorized research to find ways of controlling pollution.¹⁴⁹ In appropriate cases, research may be conducted in house by the staffs of the various government departments themselves. More typically, it is contracted to universities, private research organizations or companies involved in the substantive areas under consideration.

Research may be shaped in several directions. Better and less expensive forms of air and water treatment are an obvious objective. There may also, however, be other less traditional directions in which research can be channeled with even more attractive long term potential.

A very large proportion of waste products that pollute the water, the land or the air are inevitable consequences of industrial life. To some degree, the creation of such wastes can be reduced or avoided; for example, control over fuels used for power production

can eliminate or at least reduce emissions of sulfur compounds into the air. While research in those directions is important, there is inevitably going to be an irreducible minimum of emissions of pollutants about which something will have to be done. Much of the effort thus far has been devoted to finding ways of disposing of such products in the least harmful fashion. Garbage is towed out to sea and there dumped, rather than dropped into rivers.¹⁵⁰ Nuclear wastes are buried deep in the ground.¹⁵¹ The unuseable heat from nuclear power production is dissipated into the atmosphere rather than injected into lakes and rivers.¹⁵² In some cases, little more is accomplished than the substitution of one form of pollution for another, without always even the certainty that the new is less damaging than the old.¹⁵³ Some of our other efforts are based on the notion that we still have infinite, rather than finite, receptacles for our waste in the oceans and under ground. This may be true for the short run, but it is certain that it will not remain true forever. To treat the ocean today as a forever-patient dump for wastes to the end of time is the precise analogue of the notion a few decades ago that the air and the lakes and the rivers could take any amount of waste products. Sooner or later this must cease; although the role of the ocean in the entire structure of life on this planet is not fully understood, the possibility of a disaster of unprecedented dimension through upsetting of its life balance ought not to be ignored.¹⁵⁴

If, therefore, it is conceded that, as our gross national product becomes grosser and grosser, no place on earth will exist where we will be able eternally to dispose of our waste, the choices would seem inevitably to narrow down to two. We can stop all growth--of population, industrial and agricultural production, everything. Or, we can give highest priority to the recycling of wastes. To stop growth would give rise to serious ethical problems as well as acute political difficulties. With a large part of the population of even this unprecedentedly prosperous country living below a decent standard of living, it would be callous indeed to adopt a policy of no further economic growth. When the problem is viewed in the context of much larger populations elsewhere in the world, surviving at or below the subsistence level, a decision to put an end to economic development would indeed be difficult to defend. Difficult, that is, unless there were clear and convincing evidence that all life might be terminated if such drastic measures were not instantly adopted. And the knowledge of global ecology has not yet advanced to the point where such predictions could be made with confidence, convincingly, and in time.

But even if it were ethically justifiable to make such a decision, it is impossible to imagine that it would be politically feasible. Those not sharing in the bounty of modern industrial progress can scarcely be expected to accept a permanent barricade against the opportunity ever to raise their standards of living, unless the more affluent were willing to bring

their own level down to that of the poor--a decision which, on any wide scale, is utterly without historical precedent. Even if the United States were willing to put a moratorium on its own growth, the rest of the world would go its own course.

The alternative would seem to be a high priority on research into ways in which waste products can be recycled and, particularly, how this can be done at a tolerable cost.¹⁵⁵ Most of the products which pollute the air and the water, as well as the solid wastes, have at least some potential commercial value.¹⁵⁶ Although they are not worth the cost of recapturing them, neither are they utterly valueless. Many of them, in addition, contain elements in comparatively short supply which one day will undoubtedly be needed.¹⁵⁷ If someone were tomorrow to develop a way in which we could shoot all of our polluting wastes into outer space (perhaps using nuclear waste as the fuel?) despite the immediate attractiveness of the idea, cooler heads would probably quickly decide that the irrevocable loss of these materials to humanity ought to be avoided.

Reclamation of some pollutants has been economically successful. Municipal sewage has been turned into saleable fertilizer.¹⁵⁸ Fly ash gathered from smokestacks has been made into cinder block and other useful construction materials.¹⁵⁹ Solid wastes have been compressed into useful land fill¹⁶⁰ (though at times creating fresh problems involving water pollution and marine ecology).¹⁶¹ Old steel, aluminum, glass and paper can all be used to make new. The sulfur emitted

in paper manufacturing might be regarded as a low grade ore, refinement of which is too costly to be economically feasible under present technology, but might become reclaimable at a profit at some later stage of technological development.¹⁶²

Thermal pollution from power plants involves the dissipation of heat of too low a grade to be commercially useable, thus presenting the unpleasant choice of either spoiling our rivers, changing the local atmospheric climate or curtailing total power production. Research devoted to finding ways to utilize this heat for economically viable purposes might afford the opportunity to escape having to choose among any of these unattractive alternatives.

Even if the research did not lead to a profitable use of the waste, if it gave rise to a use which was only marginally unprofitable it could permit the institution of subsidies at a much lower level than would otherwise be required.¹⁶³ Furthermore, research should not be limited to technological areas; related studies of potential markets, labor supplies and the like are also needed.

In short, there are a number of different aspects of the pollution problem on which research would be appropriate and where results outweighing by many times the cost of the research might reasonably be hoped for. While the proposition that the problems generated by technology may be cured by more technology is far from self-evident, increased use of research appears to offer the only reasonable alternative to the extremely unattractive choice of answers to our present

environmental crisis suggested above.¹⁶⁴ And in our society, the federal government is by far the largest potential source of the funds needed for this purpose.

ARTIFICIAL GOVERNMENT MARKETS FOR WASTE

Related to the foregoing suggestion is the idea that the financial power of the federal government be employed to provide markets for waste products unless and until ways are found to dispose of them profitably.¹⁶⁵ In many circumstances, the cost to the government of buying and processing these products and disposing of them as best it can would be substantially less than either the cost of replacing the process completely or of slowing down a significant portion of the economy. Moreover, depending upon geographical considerations and the expense of transportation, a government marketing program might afford economies of scale which could not be matched by the individual enterprises involved, reducing the loss in disposing of the products or conceivably even turning a loss into a profit.

EFFLUENT AND SIMILAR CHARGES

Considerable attention has been given in recent years to the notion of charging those users of the environment--especially water--for the pollution they cause.¹⁶⁶ The theory is, that while most costs of production are reflected in the profit and loss figures of the producer and must therefore be given appropriate attention in a cost analysis of a given program, it has been traditional to treat the cost of polluting the environment

as zero, with the entire loss borne either by persons downstream or downwind or by society as a whole. The effluent charge is an attempt to find a device for internalizing these costs and imposing them upon the polluter in the same fashion as the more traditional costs of production must be borne by him.

This has been the basis of the program in effect for a number of years in the Ruhr Valley in Germany and has apparently been marked by considerable success in that area.¹⁶⁷ Charges which may be regarded as taxes are scaled in proportion to the quality and quantity of what is emitted and the proceeds used for large scale purification plants. A concern which finds its own particular circumstances are such that it could more cheaply purify its own wastes than pay for its share of the large scale operation would be free to do so. This, in turn, would presumably be desirable since the total charge on the economy would be less.

Such a program obviously involves many problems. It would work more easily with a small river, which could be dammed and gathered into a purification plant and then discharged below. It is not clear that at the present level of technology the lower Hudson or the Mississippi would be appropriate for any such process.

Certain kinds of solid wastes could also be the subject of a charge of this kind, perhaps at so much per pound, modified where the substances involved were especially easy or difficult to dispose of.¹⁶⁸

It would be more difficult to employ an effluent charge on air pollution. The air cannot be artificially

laundered, and it is unlikely that it will be feasible to connect all the smokestacks in a large area into one central receiving vessel in which purification could somehow take place.

It should also be noted that the imposition of an effluent charge on one type of pollution, such as that of the water, without a corresponding control (through tight regulation if a charge is inappropriate) on other forms of pollution, such as that of the atmosphere, would serve simply to divert the damage from the one medium to the other without any necessary gain. If paper mills, for example, were charged for polluting streams but left free to burn their debris in the air, little would be gained from the use of the effluent charge.

Even in the one circumstance where effluent charges are most likely to be useful, in the control of water pollution in river basins, many problems remain. There are difficulties in measuring quantities and composition of discharge. Certain types of damage, such as destruction of the river or lake bottom or the introduction of toxic compounds of mercury and other metals, may be beyond the reach of any curative process, so that no charge would be high enough to reflect the harm done. Moreover, river basins suffer not only from waterside industrial plants and sewage systems, but also from many activities far inland, such as the running off of agricultural fertilizers, organic wastes and pesticides. Problems of measuring the nature and amount of those run-offs from farms, animal feeding grounds and the like would seem to be extremely difficult. Perhaps the notion of the

effluent charge could be modified to make it work in such situations, by abandoning the attempt to tie the amount to be paid to the cost of correcting the payer's effluence.

None of the foregoing, however, is intended to suggest that effluent charges may not be a good solution to at least some of our problems, especially those involving water pollution. Much more research clearly has to be done.¹⁶⁹ It is not necessary to accept the enthusiastic conclusions of the supporters of the effluent charge, some of whom regard it as virtually a total solution for major problems.¹⁷⁰ In many instances, it can play a significant role, not in competition but in conjunction with other more traditional regulatory devices. In fact, in some contexts, if effluent charges are going to work at all, they will have to be coupled with effective prohibitions of alternative courses of conduct.

In short, the case for effluent charges has been neither proved nor refuted. Until Vermont adopted them last year,¹⁷¹ they had not been tried in this country, and we do not really know whether experience with them abroad will offer conclusive proof. Their proponents claim that direct enforcement has been tried and proved a failure and that this remains the only meaningful alternative; the premise of this argument may, however, be questioned, since it can scarcely be argued that we have ever really given vigorous enforcement a try.¹⁷²

The ultimate question in much of this is who will bear the cost? Economic and political, as well as ethical, considerations probably have to be taken into account in reaching an answer. Ideally, the users of a product should pay for whatever it costs to make it, including such costs as the effect on the environment which until recently have been masked. There are problems of vested interests, however, not all of an invidious nature. Industries and employment are often dependent upon an existing permissive legal structure, and governmental assistance to cushion the shock of change has many precedents.¹⁷³ There may also be activities whose role in the national life is regarded for collateral reasons as sufficiently important that some of the cost should be borne by the public at large. In terms of ability to pay, one cannot generalize as to all industries in determining whether it is better that expenses be borne by the taxpayers or by the consumers of the products of the industry.¹⁷⁴ Perhaps the environmental costs of food production, for example, should be borne by those who eat it in proportion to their consumption, rather than by essentially the same people, but pursuant to a graduated income tax; but this proposition is certainly not self-evident. In any event, the loss should not be permitted through inattention and inaction to fall upon a group of downstream or downwind victims nor should the total quality of life for everyone, or indeed the likelihood of survival, be permitted to continue to deteriorate. Political decisions of the highest order are required in the selection among these

alternatives. The wider the range of possible devices for deflecting these costs in different directions, the better the basis upon which such decisions may be predicated.

Use of the Purchasing Power of the Federal Government

The federal government, with an annual budget of \$200 billion, consumes about a fifth of the gross national product.¹⁷⁵ Correspondingly, it therefore is the customer for a fifth of the nation's products and services. This is, of course, a national average; in many industries the fraction is substantially higher and in a few it is negligible.

As the economic effect of the federal government's purchases grew, observers recognized that the way in which the government procured might play a large part in shaping many aspects of American life. Even before it was clear that the regulatory power of the federal government could enforce minimum wage levels in the economy generally or even in products crossing state lines,¹⁷⁶ Congress enacted the Walsh-Healey Act¹⁷⁷ imposing such standards in the performance of government purchase contracts.

Another instance of conscious attention to government procurement policies to affect collateral objectives may be found in the continuing effort to prevent distortions in the economy induced by what appears to be a natural tendency for government purchases to be made from big business. Starting with World War II, various government programs have sought to increase the

proportionate share of small business concerns in sales to the government.¹⁷⁸ This has been done through a number of devices: the administrative inclusion of "boiler plate" clauses in government contracts requiring prime contractors to subcontract to small business concerns wherever possible;¹⁷⁹ administrative rules inserted in the Armed Service Procurement Regulation requiring contracting officers to deal with small business concerns to the greatest extent possible;¹⁸⁰ and statutory requirements together with creation of an independent agency in the Executive Branch (the Smaller War Plants Corporation in World War II,¹⁸¹ the Small Defense Plants Administration during the Korean War,¹⁸² and the Small Business Administration¹⁸³ since).

In these programs for increasing the role of small business in government procurement, the emphasis has been less on imposing requirements upon a contractor already selected (as under the Walsh-Healey Act) as in influencing the selection of the contractor to do the work or to sell the goods to the government.

Still another collateral use of the contracting power is found in the attempts to prohibit racial and other invidious forms of discrimination in employment. Again starting in World War II, with the Fair Employment Practices Commission,¹⁸⁴ there have been a series of executive orders¹⁸⁵ requiring all government contractors and first-tier subcontractors to avoid discrimination, not only in the performance of the particular contract in question but throughout their entire operations.¹⁸⁶

The original motivation for creation of this program was undoubtedly the assumption that it would be impossible to put a fair employment program through Congress, in the face of a threat of a Southern filibuster. The hope was that a sufficiently large proportion of the nation's employers would find it necessary or at least desirable to do business with the government that the executive order, bolstered by the contract clauses, would have a major impact on employment practices throughout the nation.

Interestingly, however, in 1964 when regulatory legislation to ensure fair employment was finally adopted by the federal government,¹⁸⁷ the contracts program was not abandoned, and indeed, superficially at least, has since even showed some signs of being strengthened.¹⁸⁸ An exploration of the reasons for this may be of some value in the assessment of the usefulness of contract provisions as a substitute for or an adjunct to direct regulatory control of pollution.

The shortcomings of Title VII of the Civil Rights Act of 1964 as an adequate federal remedy for employment discrimination do not spring from constitutional limitations upon federal control over local employment, but rather from inherent weaknesses in the statute. For one thing, a cumbersome administrative proceeding was required as a prerequisite to the institution of a civil action for enforcement;¹⁸⁹ moreover, in the first few years of the statute, some lower court decisions,¹⁹⁰ since reversed,¹⁹¹ made it appear that the administrative barriers were even more difficult to surmount than has proved to be the case. Secondly,

the statute offers no criminal sanctions, but merely injunctive relief together with such ancillary relief as back pay where appropriate.¹⁹² Finally, the main litigation burden was imposed upon aggrieved individuals, which generally meant poor black workers in the South, so that in practice the major enforcement effort was undertaken not by the federal government but by civil rights organizations, in particular the NAACP Legal Defense Fund.¹⁹³ With limited resources, such agencies could concentrate only on fighting a selected group of test cases that might result in favorable precedents, rather than engaging in a vigorous nationwide enforcement program. To be sure, the statute permitted the Attorney General to bring his own action if there were a "pattern or practice" of discrimination,¹⁹⁴ but this authority has been sparingly used.¹⁹⁵ Some assistance has also been rendered to private litigants by the Equal Employment Opportunity Commission, through the release of investigative data, and through submission of amicus curiae briefs.¹⁹⁶ Despite these governmental efforts, however, the program has been relegated in the main to private enforcement.¹⁹⁷

The federal contract compliance program, on the other hand, does offer at least the potential of a government-staffed enforcement program. Moreover, it offers an array of sanctions far more effective than the injunction (even if sweetened with back pay) provided by the statute. One who violates the executive order--and, at the same time, breaches his contract--is subject to the normal array of remedies for breach of contract, such as cancellation of the contract and an action for

damages, or for specific performance.¹⁹⁸ Even more important, the executive order permits the blacklisting of a violating employer from further government business.¹⁹⁹ In theory, the in terrorem effect of these threats ought to frighten into meticulous compliance all government contractors doing any appreciable amount of business with the government.

No citation of authority is necessary, however, to demonstrate that employment discrimination has not been defeated. For that matter, neither has the share of government contracts awarded to small business concerns been substantially enhanced during the long period in which government contracting officials have supposedly been moving in this direction.²⁰⁰ Further studies of the functioning of these programs for employing the government's contracting power would undoubtedly be of help in determining whether, and in what fashion, that power could be used in order to protect the environment. At least one explanation, however, leaps to the fore as a clue to the apparent failure of both the small business and fair employment programs. This is the "mission orientation" of the government contracting officer, and particularly the contracting officer in the military establishment. Whenever there is a need, sometimes urgent, to procure weapons or other equipment or even to construct a building quickly, the contracting officer will be regarded as having done his job best if he awards the necessary contracts as rapidly as possible and to concerns whose size and financial responsibility afford assurance of prompt and satisfactory performance.

The injection of what he considers extraneous factors into the contract-awarding process causes the contracting officer considerable anguish, and his natural inclination is to concentrate narrowly on his primary mission and pay lip service to the other elements which supposedly should enter into his decision. Unless strong pressure from higher echelons compels him to favor a small business concern or refuse to deal with a discriminating employer, he is not likely to do it. If his superiors, and their superiors all the way up, are similarly motivated to get on with the job of procuring the best for the least money with a minimum of delay, and if there is no threat of reprimand or other sanctions against the contracting officer who ignores what he regards as collateral considerations, he is unlikely to heed them. When the Deputy Secretary of Defense insisted on awarding procurement contracts to Southern textile mills which had been discriminating against blacks and had not even complied with the regulation requiring them to enter into written agreements to take corrective measures,²⁰¹ what lesson was likely to be learned by the contracting officer many echelons below?

It should be noted that the effectuation of this program has no longer been left entirely to the mercy of the contracting officer or the procuring department. A separate Office of Federal Contract Compliance, under the Secretary of Labor, has been assigned responsibility for assuring compliance.²⁰² Nevertheless, it seems quite clear that racial discrimination in employment has not been eliminated or even sharply curtailed in this country, even among government contractors.

With this history in mind, we can approach the question of the use of the contracting power for preservation of the environment. A contract clause could provide, for example, that in the performance of the contract no federal regulation pertaining to emission into the air or water, or other appropriate substantive rule, was to be violated.²⁰³ It could go a step further and follow the fair employment pattern of requiring the contractor to agree to adhere to these rules in all of its operations, whether related to the specific contract or not.²⁰⁴ The same array of horrendous consequences, as theoretically applicable in cases of employment discrimination, could be detailed as punishments for contractors who broke their word.

The doubt persists, however, as to whether it would work. Contracting officers disposed to ignore, or pay mere lip service to, small business or anti-discrimination requirements should not be expected to be more zealous in their protection of the environment. In view of the great difficulties in getting federal agencies to pay adequate attention to the environmental damage they themselves are perpetrating,²⁰⁵ there is no reason to be sanguine as to the degree of vigor with which they would pursue violations by their contractors. Much, of course, would depend upon the degree of dedication at the very highest levels of the federal government. If, in fact, the present surge of interest in protection of the environment were to lead to an intense and sustained commitment at the top to take all appropriate steps, enforcement of contract provisions of the type suggested might become meaningful. It is

possible that the drive against pollution will have a more solid national consensus supporting it than ever was committed to protection of small business or to ending racial discrimination in employment.

If the contracting power is used in this fashion for environmental protection, there are strong reasons to place enforcement of the contract provisions in an agency with responsibility and expertise in the area, such as the Environmental Protection Agency or the Council on Environmental Quality. Contracting officers of procuring agencies, apart from probably lacking wholehearted devotion to environmental goals, are also not likely to have sufficient expertise to do the job well.

If enforcement through contract compliance is going to succeed, it is probably also important that the process of determining whether the contractor is in violation be made as simple as possible. The comparative success of the Walsh-Healey Act minimum wage regulations as contrasted with the failure of the employment discrimination program, may be explained at least in part by the simplicity of ascertaining what wages an employer is paying, as opposed to the difficulty of proof of racial discrimination in employment. Anti-pollution provisions are likely to fall somewhere between these extremes.

Use of the contracting power in this sense, in addition to providing stringent remedies, offers the attractive possibility of operating fairly rapidly with little or no delay for judicial review,²⁰⁶ with no need to prove violations beyond a reasonable doubt,

and with sanctions sufficiently strong to serve as a possible deterrent. If, however, even the apparently non-urgent need for textiles was sufficient to cause the federal government at its highest levels to ignore its own requirements as to racial discrimination, then a major change in mood will have to occur before an anti-pollution clause will be enforced against a manufacturer of guns or planes thought to be urgently needed for the defense of the nation.

There are other possible uses of the government's contracting power beyond the regulatory applications discussed above. For example, the government can, and frequently does, enter into contracts in order to stimulate development of various kinds. A substantial portion of the procurement activities of the defense establishment are in the area of research and development. A manufacturer, for example, is paid to attempt to create a new weapon or other device. In addition to the profits on the particular "R & D" contract, there is sometimes the hope of a subsequent production contract to make and sell the product to the government if the exploration of its feasibility proves successful.

While contracts of this sort are usually employed in connection with the regular procurement activities of the federal government as means of developing the various devices it hopes to be able to purchase for itself, there is no inherent reason to limit research and development contracts in this fashion. It would be entirely appropriate for the government to award such a contract for the production of a mechanism to be made available to non-governmental users--for

example, a device for water purification or for control of emissions at the smokestack.

There are additional possible uses for this technique. For example, the government could enter into contracts for research and development leading to production of a pollution-free automobile or an automobile powered by some device other than the internal combustion engine. The purpose could be either to encourage the development of such automobiles for general public sale, their development even at non-competitive prices for sale to the government itself, or a combination of both. Similarly, contracts could be let for development of cheaper methods of producing lead-free fuels, again with the purpose of ultimate sale to the government, to the public, or both.

Still another use of this technique would be for the government itself to undertake to build and operate model plants in industries notorious for the harm they do to the environment. Government-sponsored research might lead to the design of a paper mill, for example, which polluted neither the air nor the water. Depending on whether the end product was a design or a plant, ownership could remain in the government if deemed desirable, or it might ultimately be sold to private industry and the techniques learned made available to others in the private sector.

The extent to which the government should incur expense of this kind, as distinguished from engaging in vigorous regulation and leaving it to industry to do its own research to find the ways in which it can comply, would have to depend upon judgments as to the

appropriate allocation of expenditures among the several sectors of society, referred to above.²⁰¹

It should be noted that there is no sharp dividing line between government research and development contracts of this kind and government-sponsored research referred to above.²⁰² The latter may be handled by way of either contract or grant, depending on circumstances. Whatever the theoretical form of the technique employed, the government would, in effect, be using its financial resources to assist in the discovery of new ways of protecting the environment.

Still another way in which the government can influence the environment through its contracting power would be simply to insert specifications in appropriate procurement contracts which obliged the seller to meet government standards, even if it entailed an increase in cost. This device could also be used in the procurement of automobiles, for example.²⁰³ As a minimum, those automobiles owned by the government would pollute to a lesser extent. Moreover, the creation of that large a market for a pollution-free car might possibly tip the scales and make financially attractive to industry the production of such a car for the mass market where without such government orders this would be economically unfeasible.

Thus, the government's contracting power offers no panacea. In and of itself, it probably cannot play the major role in fighting pollution. Nevertheless, particularly in conjunction with direct enforcement techniques, there are ways in which it may be effectively used.²¹⁰

A Word on Private Litigation

While redress for private injury resulting from conduct harmful to the environment has for generations been sought through legal actions brought by those suffering especial damage, a new breed of environmental litigation has burgeoned in the last few years. Cases are now being brought by individuals, often as class actions, or by organizations dedicated to the preservation of environmental values, for the purpose of protecting an entire community, ranging in dimension from a village to the world. In some cases, the defendants are agencies of government--federal, state or local--charged either with conduct actively harmful or with failure to regulate to prevent harm by others. In other cases, the defendants are private, typically companies engaged in or threatening actions detrimental to the environment.

Such litigation can serve as a valuable device supplementary to those used by the government for the enforcement of laws and regulations.²¹¹ It can also fill the void where public enforcement authorities are remiss.²¹² And where the government itself is the offender, it can be an extremely useful antidote to the lack of sensitivity to environmental values on the part of some government officials. In addition, such actions may serve to direct badly needed public attention to the importance of environmental protection.

The magnitude of the task of enforcing the government's own regulations, however, suggests that for the

job to be done effectively the main burden must be assumed by the government itself; private persons and groups lack the resources to act on more than a sporadic, case-by-case basis. And where private actions by-pass the legislative and administrative process, seeking to induce the courts to create a common law of the environment in disregard of laws and regulations already promulgated or in the process of formulation,²¹³ they may prove to be counterproductive. Courts lack the opportunity, which is available both to Congressional committees and to the agencies charged with implementation of federal statutes, to devote continued attention to environmental problems, to view them from a nationwide perspective, or to acquire the technical expertise so necessary for effective creation of policy.

As indicated above,²¹⁴ this discussion does not purport to analyze in depth the actual or potential contribution of the various kinds of private litigation brought to protect the environment; it is intended only to suggest some of the factors pertinent to an evaluation of such litigation in the context of the overall problem of developing ways in which the federal government can effect compliance with environmental standards.

International Action

Just as the widening impact of pollution has tended to shift responsibility from municipalities and states to the federal government, the danger has become sufficiently global to be beyond the control of the

United States acting alone. But here the analogy ends; much as we may need one, we have no World Government. The next best thing would be the use of multilateral agreements for this purpose.

If, however, such agreements are sufficiently well drafted to promise meaningful improvement, they may run into serious difficulties. Less developed countries may regard environmental concern as a luxury they cannot afford. They might well regard us as "overdeveloped," in terms of the comparative affluence we have bought at the price of the most extensive despoilment of nature, and have little patience with efforts initiated by us to achieve international agreement to protect the oceans and the atmosphere. Their objections might be softened if, along with other prosperous nations, we offered to assume the bulk of the financial burdens involved, including the cost of the major research program suggested above. A United Nations conference on the human environment, at which the United States might advance its proposals, has been scheduled for 1972. In view of the urgency of the problem, however, it would seem undesirable to wait that long.

Conclusion

The techniques which have been considered, to compel or induce compliance, are not necessarily mutually exclusive; in many situations they can be used in combination. Moreover, it is desirable to have available a broad range of remedies, so as to permit selection of the appropriate one or ones in each case. Doubts,

such as have been mentioned, as to the effectiveness of some of them should not preclude their adoption. We need to experiment with every reasonable device we can invent, in order to develop the strongest possible arsenal of legal weapons; what we are seeking to protect is nothing less than the survival of the human race.

Notes

1. See p. 274, infra.
2. Compare Birmingham, The Federal Government and Air and Water Pollution, 23 BUS. LAWYER 467, 478-81, 487-89 (1968), with Edelman, Federal Air and Water Control: The Application of the Commerce Power to Abate Interstate and Intrastate Pollution, 33 GEO. WASH. L. REV. 1067, 1072-73 (1965); Hines, Nor Any Drop to Drink: Public Regulation of Water Quality, Part III: The Federal Effort, 52 IOWA L. REV. 799, 800 (1957).
3. 9 Wheat. 1 (1824).
4. Id. at 196.
5. United States v. Darby, 312 U.S. 100 (1941). The Supreme Court refused to look at Congressional motive so long as the action fell within a power conferred by the Constitution.
6. National Labor Relations Board v. Jones & Laughlin Steel Corp., 301 U.S. 1 (1937). The Court held that respondent's labor relations were subject to Congressional control because suspension of its manufacturing operations could impede interstate commerce. The Court later applied this reasoning to smaller enterprises, holding that the commerce power does not depend on the volume of commerce affected. National Labor Relations Board v. Fainblatt, 306 U.S. 601 (1939).
7. Wickard v. Filburn, 317 U.S. 111 (1942). Here, the Court applied Congressional power under the commerce clause to local activity which clearly could not be deemed commerce, asserting that whether the subject of regulation in question was "production," "consumption," or "marketing" was not material; that the activity is local is also not material; it may still be reached by Congress if it affects interstate commerce, and this "irrespective of whether such

effect is what might at some earlier time have been defined as 'direct' or 'indirect.'" Id. at 125. The Court held that home-consumed wheat would have a substantial influence on price and market conditions since to the man who grew it it supplied a need which would otherwise have to be met by purchases on the open market.

8. Id. at 127-28.

9. *Heart of Atlanta Motel v. United States*, 379 U.S. 241 (1964); *Katzenbach v. McClung*, 379 U.S. 294 (1964); *Daniel v. Paul*, 395 U.S. 298 (1969).

10. E.g., *Covington & C. Bridge Co. v. Kentucky*, 154 U.S. 204 (1894) (non-commercial travel by persons using an interstate bridge held to be interstate commerce); *United States v. Hill*, 248 U.S. 420 (1919) (transportation of property on one's person across state line held interstate commerce although destined for personal use); *United States v. Darby*, 312 U.S. 100 (1941).

11. *Champion v. Ames*, 188 U.S. 321 (1903).

12. Id. at 356 (emphasis supplied).

13. *Hoke v. United States*, 227 U.S. 308 (1913).

14. *Caminetti v. United States*, 242 U.S. 470 (1917). Other kinds of recreational facilities have been held subject to Congressional regulation on the alternative basis of: (i) the out-of-state origins of food served and equipment used, and (ii) the service of out-of-state patrons. *Daniel v. Paul*, 395 U.S. 298 (1969).

15. *Gooch v. United States*, 297 U.S. 124 (1936).

16. 312 U.S. 100 (1941).

17. Id. at 117.

18. Thus, Congress may forbid unfair labor practices which affect interstate commerce, on the part of manufacturers, without forbidding the transportation of their products.. *National Labor Relations Board v.*

Jones & Laughlin Steel Corp., 301 U.S. 1 (1937). An additional, although not essential, basis for such power would be found in instances in which a manufacturer not meeting specified standards might be able to compete advantageously in national markets with one which complied. Darby, 312 U.S. at 122. On this basis, Congressional action which sought to deny a competitive advantage to those concerns which had violated, for example, air or water pollution standards would be valid.

19. Wickard v. Filburn, 317 U.S. 111 (1942).

20. Cf. Edelman, Federal Air and Water Pollution Control and Bermingham, The Federal Government and Air and Water Pollution, *supra*, note 2.

21. The interstate commerce power has been held to apply to rivers presently impeded by obstructions that once were navigable, though only by canoe (United States v. Holt State Bank, 270 U.S. 49 (1926)) and streams that could be made navigable only through improvement (United States v. Appalachian Electric Power Co., 311 U.S. 377 (1940)), as well as a non-navigable tributary of a navigable stream so long as it in some way affects navigation (Oklahoma v. Atkinson, 313 U.S. 508, 529 (1941)). The touchstone would seem to be the navigability, rather than the interstate character of the stream, and the mere fact that a stream crosses a state line or serves as a boundary might not, without more, be sufficient for federal control. See Bermingham, *supra* note 2, at 478-79. Yet the Water Quality Act of 1965 (Pub. L. No. 89-234, 79 Stat. 901, now 33 U.S.C.A. § 1157 (1970)), provided for abatement of pollution of "interstate or navigable waters."

In relinquishing to the states title to "land beneath navigable waters," Congress was careful to retain the navigational servitude of the United States. Submerged Lands Act, 67 Stat. 32 (1953), 43 U.S.C. § 1314 (1964). This reservation has been held to preserve the federal power to protect wildlife in navigable waters from harm caused by environmental changes. Zabel v. Tabb, 430 F.2d 199, 206 (5th Cir. 1970).

There is another possible constitutional basis for federal regulation of navigable waters, whether interstate or not, entirely distinct from the commerce clause. The judicial power (U.S. CONST. art. 3, § 2)

extends, inter alia, "to all Cases of Admiralty and Maritime Jurisdiction"; bolstered by the necessary and proper clause, this provision has been held to give Congress the power to enact substantive law. It is not clear, however, how far this power can be extended beyond matters closely related to the subject-matter of admiralty jurisdiction. Cases arising thus far have been well within such traditional limits. See, e.g., Panama R.R. v. Johnson, 264 U.S. 375 (1924) (upholding a change of rules relating to the liability of a maritime employer for injuries to his employees); In re Garnett, 141 U.S. 1 (1891) (upholding statute imposing limited liability for loss of cargo).

22. See Edelman, supra note 2, at 1070-73.

23. See Birmingham, supra note 2, at 478-79. See also Brown & Duncan, Legal Aspects of a Federal Water Quality Surveillance System, 68 MICH. L. REV. 1131, 1133 (1970); but cf. id., note 7.

24. See S. REP. NO. 638, 88th Cong., 1st Sess. 3 (1963).

25. See United States v. Bishop Processing Co., 287 F. Supp. 624, 629 (D. Md. 1968). See also id., 423 F.2d 469 (4th Cir. 1970), cert. denied, 398 U.S. 904 (1970). An analogy might be seen in cases holding that the movement of electrical impulses by wire or through the air is commerce. Pensacola Telephone Co. v. Western Union Telegraph Co., 96 U.S. 1 (1877); Federal Radio Commission v. Nelson Bros., 289 U.S. 266 (1933).

26. See Edelman, supra note 2, at 1083-87.

27. United States v. Butler, 297 U.S. 1, 65 (1936), construing art. 1, § 8 of the Constitution. On the state level, see, e.g., CAL. HEALTH & SAFETY CODE § 24370:2 (West 1967).

28. Cf. Frothingham v. Mellon, 262 U.S. 447 (1923); Flast v. Cohen, 392 U.S. 83 (1968).

29. The power to tax "is given in the Constitution, with only one exception and only two qualifications. Congress cannot tax exports, and it must impose direct

taxes by the rule of apportionment, and indirect taxes by the rule of uniformity. Thus limited, and thus only, it reaches every subject, and may be exercised at discretion." Chief Justice Chase, in License Tax Cases, 5 Wall. 462, 471 (1867).

30. See, e.g., *Veazie Bank v. Fenno*, 8 Wall. 533, 548 (1869); *McCray v. United States*, 195 U.S. 27, 154-59 (1904); *United States v. Doremus*, 249 U.S. 86, 93 (1919); *United States v. Kahlrger*, 345 U.S. 22, 26-31 (1953). But cf. *Bailey v. Drexel Furniture Co.*, 259 U.S. 20 (1922); *Carter v. Carter Coal Co.*, 298 U.S. 238 (1936).

31. The tax would simply be the means selected by Congress as necessary and proper for the exercise of its power to regulate interstate commerce. "The power of taxation, which is expressly granted, may of course be adopted as a means to carry into operation another power also expressly granted." *United States v. Butler*, 297 U.S. 1, 69 (1936).

32. See pp.258-63, infra; G. Rathjens, National Environmental Policy--Goals and Priorities, p.30 supra. For the use of this device at the state level, see VT. STAT. ANN., tit. 10 § 910(A) et seq. (Supp. 1970).

33. See Hearings before a Special Subcomm. on Air and Water Pollution of the Senate Comm. on Public Works, 89th Cong., 1st Sess. (1965).

34. 297 U.S. 1 (1936).

35. Cf. *Steward Machine Co. v. Davis*, 301 U.S. 548 (1937); *Helvering v. Davis*, 301 U.S. 619 (1937).

36. Cf., e.g., *Carter v. Carter Coal Co.*, 298 U.S. 238 (1936); *Schechter Poultry Corp. v. United States*, 295 U.S. 495 (1935).

37. Congress's powers are derived not only from specific grants of authority but also from the clause authorizing Congress "to make all laws which shall be necessary and proper for carrying into execution the foregoing powers, and all other Powers vested by this Constitution in the Government of the United States, or

in any Department or Officer thereof." U.S. CONST., art. I, § 8, cl. 17 (emphasis supplied).

38. United States v. Shauver, 214 Fed. 154 (D. Ark. 1914); United States v. McCullagh, 221 Fed. 288 (D. Kans. 1915).

39. 39 Stat. 1705 (1916).

40. Acting, as it did at that time, on behalf of Canada in its foreign relations.

41. 252 U.S. 416 (1920).

42. There is in fact a Boundary Waters Treaty of 1909 with Great Britain (acting on behalf of Canada), containing a provision (in Art. IV) that the boundary waters "shall not be polluted on either side to the injury of health or property on the other." 36 Stat. 2448, 2450 (1909). While an international joint commission has been established, its powers are limited, and there is no other implementing legislation. See Erichsen-Brown, Legal Implications of Boundary Water Pollution, 17 BUFF. L. REV. 65 (1967).

43. P. 275, infra.

44. The Supreme Court has never held a treaty invalid on any grounds. It has, however, held an executive agreement invalid as violative of express constitutional restraints on the federal government. In Reid v. Covert, 354 U.S. 1 (1957), the Court held that the Status of Forces Agreements could not validly authorize the trial by court-martial of civilian dependents of American soldiers overseas, since the Constitution guarantees them a jury trial. The Court indicated by dictum that the treaty power is similarly limited. Id. at 16.

The distinction should be kept in mind, however, between attacks based on violations of express constitutional restraints on federal action, and those based on 10th Amendment considerations; Missouri v. Holland (252 U.S. 416 (1920)) would presumably dispose of the latter unless it proved possible to persuade the Court that the purported treaty was a sham.

45. Another possible basis for Congressional authority to preserve the environment is the national defense power (found chiefly in art. I, § 8, cls. 11-16), and in fact federal control over the environmental as well as other aspects of atomic energy is generally regarded as predicated on that power. The relationship of other types of pollution to defense can probably also be demonstrated; but at most the links would seem to be no stronger than those to interstate commerce, and the much larger body of pertinent precedent in the latter area would suggest that greater reliance should continue to be placed upon the commerce clause.

It has sometimes been asserted that there is a constitutional right under the Ninth Amendment to a decent environment, and at least something of a hint in one Supreme Court case that the Ninth Amendment may serve as a further source for creation of individual rights not hitherto recognized. See Griswold v. Connecticut, 381 U.S. 479, 484 (1965) (majority); id. at 488 et seq. (concurring opinion of Goldberg, J. B. PATTERSON, THE FORGOTTEN NINTH AMENDMENT (1955); Sive, The Environment--Is it Protected by the Bill of Rights?, CIVIL LIBERTIES, April 1970, at 3. If there is such a right under the Ninth Amendment, and if it is part of the fundamental rights carried over or "incorporated" as limitations upon the states by the Fourteenth Amendment, it could be argued that the congressional power to implement the Fourteenth Amendment might include authority to protect these rights. By way of analogy, it was held in Katzenbach v. Morgan 384 U.S. 641 (1966), that Congress could forbid the requirement of literacy in English as a voting qualification when imposed upon Spanish-speaking citizens of Puerto Rican origin. The Court held that this could be done under either of two theories--that the literacy requirement, although not in itself a violation of the Fourteenth Amendment, might interfere with the assertion by residents of Puerto Rican origin of their rights to equal treatment--such as in the allocation of public services which were guaranteed by the Fourteenth Amendment; or, alternatively, that even if the courts would not themselves find that such a literacy requirement violated the equal protection clause, nevertheless, a reasonable judgment by Congress to

that effect would be accepted by the Court.

One problem, however, with the use of the Fourteenth Amendment is that it applies only to state action, and might not be applicable to conduct by nongovernmental organizations injuring the environment of others. Since there are so many better grounds for finding a constitutional basis for federal regulation than this one, it may not be worth pursuing further, except perhaps as an intellectual exercise.

46. In most of the eastern states, rights to water are based on ownership of adjacent, or "riparian," land. In some of these states, allocation is based on "natural flow," in others on "reasonable use." In the West, where water is scarcer, rights are based on "appropriation"; the first user, regardless of land ownership, acquires rights which continue unless he fails to utilize them. See J. SAX, WATER LAW, PLANNING AND POLICY: CASES AND MATERIALS 1-3 (1968) for an exceptionally clear outline of the various theories of water rights. See also Note, Private Remedies for Water Pollution, 70 COL. L. REV. 734 (1970).

47. "Rights, property or otherwise, which are absolute against all the world are certainly rare, and water rights are not among them. Whatever rights may be as between equals such as riparian owners, they are not the measure of riparian rights on a navigable stream relative to the function of the Government in improving navigation. Where these interests conflict they are not to be reconciled as between equals, but the private interest must give way to a superior right, or perhaps it would be more accurate to say that as against the Government such private interest is not a right at all." United States v. Willow River Power Co. 324 U.S. 499, 510 (1945).

48. The police power enables a state to regulate for the comfort, health, safety, and welfare of its citizens; its scope is limited only by provisions in the federal or applicable state constitution. See, e.g., Jacobson v. Massachusetts, 197 U.S. 11, 25 (1904) Town of Shelby v. Cleveland Mill and Power Co., 155 N.C. 196, 200, 71 S.E. 218, 220 (1911). The typical state pollution control act would seem in theory to present a classic example of a legitimate exercise of the police power: protection against significant

danger to public health and welfare; consequently, such legislation has been uniformly upheld. See, e.g., *Hatcher v. Board of Supervisors*, 165 Iowa 197, 145 N.W. 12 (1914); *Huron Portland Cement Co. v. Detroit*, 362 U.S. 440, 442 (1960).

49. "[I]t is no objection to the exertion of the power to regulate interstate commerce that its exercise is attended by the same incidents which attend the exercise of the police power of the states." *United States v. Carolene Products Co.*, 304 U.S. 144, 147 (1938).

50. Such control over the property rights of abutting owners is based on the federal government's control over navigable waterways, and is not deemed a taking of the riparian owner's property for which he must be compensated; the property is deemed always to have been held subject to the lawful exercise of just such power. *United States v. Willow River Power Co.*, 324 U.S. 499, 510 (1945), note 47 supra; see also *United States v. Chicago M. St. P & P. R. Co.*, 312 U.S. 592 (1941); *United States v. Appalachian Electric Power Co.*, 311 U.S. 377 (1940). This power may be employed not only for navigation, but also to protect environmental values. *Zabel v. Tabb*, 430 F.2d 199 (5th Cir. 1970).

In other areas of federal activity as well, the fact that regulation may reduce the value of property does not in itself defeat its constitutionality or necessitate compensation. *Federal Power Comm. v. Hope Natural Gas Co.*, 320 U.S. 591, 601 (1944); *Bowles v. Willingham*, 321 U.S. 503, 517-18 (1944).

51. See *Lawton v. Steele*, 152 U.S. 133, 136, 137 (1894); *C. B. & Q. v. Illinois*, 200 U.S. 561, 592-94 (1906).

See also *Huron Portland Cement Co. v. Detroit*, 362 U.S. 440, 442 (1960), referring to the Detroit Smoke Abatement Code: "The Ordinance was enacted for the manifest purpose of promoting the health and welfare of the city's inhabitants. Legislation designed to free from pollution the very air that people breathe clearly falls within the exercise of even the most traditional concept of what is compendiously known as the police power."

52. Id.

53. *Day-Brite Lighting, Inc. v. Missouri*, 342 U.S. 421, 424 (1952).

54. See *Euclid v. Ambler Realty Co.*, 272 U.S. 365, 387-88 (1926).

55. *Miller v. Schoene*, 276 U.S. 272 (1927); but cf. *Pennsylvania Coal Co. v. Mahon*, 260 U.S. 393 (1922).

56. See *United States v. Darby*, 312 U.S. 100, 114 (1941); *Hamilton v. Kentucky Distilleries & Warehouse Co.*, 251 U.S. 146, 156 (1919).

57. The ancient doctrine that the landowner's property rights to the air above his land extend to the heavens has been discarded. *United States v. Causby*, 328 U.S. 256, 261 (1945). But it has also been held that the landowner 'owns' "at least as much of the space above the ground as he can occupy or use in connection with the land." *Id.* at 264. The Court in Causby recognized that airspace is a "public highway" and the federal authority to regulate air commerce and to control the navigable air space rests securely on the commerce clause and has never been doubted. See *Braniff Airways v. Nebraska State Bd. of Equalization*, 347 U.S. 590, 596-97 (1954). Yet the Court in Causby found it necessary to qualify this power, which unqualified would have consequences not attending the exertion of Congress's plenary power over navigable waters: ". . . the flight of airplanes, which skim the surface but do not touch it, is as much an appropriation of the use of the land as a more conventional entry upon it" (328 U.S. at 264). See also *Griggs v. County of Allegheny*, 369 U.S. 84, 87 (1962).

58. *United States v. Bishop Processing Co.*, supra note 25.

59. See Michelman, Property, Utility, and Fairness: Comments on the Ethical Foundations of 'Just Compensation' Law, 80 HARV. L. REV. 1165 (1967), Sax, Takings and the Police Power, 74 YALE L. J. 36 (1964).

60. E.g., *Lochner v. New York*, 198 U.S. 45 (1905).

61. E.g., *West Coast Hotel Co. v. Parrish*, 300 U.S. 379 (1937). But many state courts have continued to

invalidate state legislation on grounds of substantive due process under the due process clauses of state constitutions. See Paulsen, The Persistence of Substantive Due Process in the States, 34 MINN. L. REV. 91 (1950); Hetherington, State Economic Regulation and Substantive Due Process of Law, 53 NW. U. L. REV. 13, 226 (1958).

62. See Greenawalt, "Uncontrollable" Actions and the Eighth Amendment: Implications of Powell v. Texas, 69 COLUM. L. REV. 927, 972 (1969); Kent v. Dulles, 357 U.S. 116 (1958); Griswold v. Connecticut, 381 U.S. 479, 486 (1965) (concurring opinions).

63. For examples of the Court's tolerance of legislation in the economic area, see, e.g., Williamson v. Lee Optical Co., 348 U.S. 483 (1955); Day-Brite Lighting, Inc. v. Missouri, 342 U.S. 421 (1952).

64. The last mentioned proposal would at least avoid the "intrusion into the bedroom" problems that would arise if the alternative of compulsory contraception were adopted. Cf. Griswold v. Connecticut, 381 U.S. 479 (1965).

65. Compare Buck v. Bell, 274 U.S. 200 (1927), with Skinner v. Oklahoma, 316 U.S. 535 (1942).

A few other constitutional limitations on federal action might prove pertinent.

Laws unreasonably classifying those subject to their command might run afoul of principles of equal protection, which are applied to the federal government through the due process clause of the Fifth Amendment. Bolling v. Sharpe, 347 U.S. 497 (1954). But regulation of business is seldom invalidated on equal protection grounds these days. Compare Ry. Express Agency v. New York, 336 U.S. 106 (1949) with Morey v. Doud, 354 U.S. 457 (1957); cf. Shapiro v. Thompson, 394 U.S. 618 (1969), and Mr. Justice Harlan, dissenting, at 655.

Inspection of plants to determine whether pollution regulations were being obeyed might have to be made pursuant only to warrant in order to avoid violation of the Fourth Amendment's prohibition of unreasonable searches and seizures. See Camara v. Municipal Court, 387 U.S. 523 (1967).

66. Wechsler, The Political Safeguards of Federalism--

The Role of The States in the Composition and Selectio
of the National Government, 54 COLUM. L. REV. 543,
544-45 (1954).

67. See Grad, supra p. 160 et seq.

68. Art. VI, § 2.

69. See Grad, supra p. 51 et seq.

70. Congress expressly considered the preemption problem in connection with its authorization to the Secretary of Health, Education and Welfare to prescribe emission standards for new motor vehicles and decided to bar state controls except where a state had adopted a higher standard before March 30, 1966--in effect, barring all state regulation except that of California Air Quality Act of 1967, Pub. L. No. 90-148, § 2, 81 Stat. 490, U.S.C. §§ 1857f-1 et seq. (Supp. V, 1965-66). Since the federal statute relies upon a woefully inadequate regulatory technique, i.e. clearance of all new cars or engines of a given model if a test vehicle passes the test (see Grad, supra p. 54), preemption serves to preclude meaningful action at any level of government.

Cases raising questions of whether federal legislation barred state or local controls have occasionally involved environmental regulation. In *Huron Portland Cement Co. v. City of Detroit*, 362 U.S. 440 (1960), Detroit's Smoke Abatement Code was held validly applicable to a ship using its waters, despite compliance of the ship's boilers with federal boiler inspection laws. The Court relied heavily on Congressional statements which at the time declared air pollution to be primarily a matter of state and local concern. In *American Airlines, Inc. v. Town of Hempstead*, 272 F. Supp. 226 (E.D.N.Y. 1966), aff'd, 398 F.2d 369 (2d Cir. 1968), cert. denied, 393 U.S. 1017 (1969), a municipal ordinance attempting to ban excessive noise from jet aircraft was invalidated on grounds of federal preemption. See also *Allegheny Airlines, Inc. v. Village of Cedarhurst*, 132 F. Supp. 871 (E.D.N.Y. 1955), aff'd, 238 F.2d 812 (2d Cir. 1956). Interestingly, federal aircraft noise regulations apparently do not preclude airport operators from imposing more stringent standards, and this is true even where the airport is operated by an agency of state or local government. See

Port of New York Authority v. Eastern Air Lines, Inc., 259 F. Supp. 745 (E.D.N.Y. 1966); S. REP. NO. 1353, 90th Cong., 2d Sess. 4 (1968); 34 Fed. Reg. 18355-56 (1969).

Litigation is now pending which raises the question of whether a state may impose more stringent regulations on disposal of nuclear waste than those promulgated by the Atomic Energy Commission. Northern States Power Co. v. Minnesota, D. Minn., filed Aug. 26, 1969.

71. For a survey of the enforcement techniques most generally employed by the states in this area, see Grad, supra p. 117 et seq.

72. F. Grad, PUBLIC HEALTH LAW MANUAL 138 (2d ed. 1970).

73. See, e.g., People v. Zerillo, 34 Cal. 2d 222, 223 P.2d 223 (1950); Brown v. State, 23 Del. 159, 74 Atl. 836 (1909); 22 C.J.S. § 1(e); AMERICAN LAW INSTITUTE, MODEL PENAL CODE §§ 1.12, 2.02 (1962). Apart from constitutional considerations, this tradition weighs heavily in persuading courts to read such a requirement into criminal statutes in which it does not appear explicitly.

74. See Greenawalt, supra note 52, at 934 et seq.; Packer, Mens Rea and the Supreme Court, [1962] SUP. CT. REV. 107; Dubin, Mens Rea Reconsidered: A Plea for a Due Process Concept of Criminal Responsibility, 18 STAN. L. REV. 332, 378 (1966). But see Gribetz & Grad, Housing Code Enforcement: Sanctions and Remedies, 66 COL. L. REV. 1254, 1279 (1966). Where fines are small, tests of constitutionality are likely to be rare.

While the Supreme Court has indicated that mens rea is not constitutionally required as an element of a crime (United States v. Balint, 258 U.S. 250 (1922); Fisher v. United States, 328 U.S. 463 (1946); Leland v. Oregon, 343 U.S. 790 (1952)), there have been more recent indications of inroads into that principle. Cf. Lambert v. California, 355 U.S. 225 (1957); Robinson v. California, 370 U.S. 660 (1962).

There is considerable controversy as to the propriety of a doctrine of "strict liability" in the criminal field. Actions detrimental to public welfare have been characterized as "in the nature of neglect where the

law requires care; inaction where it imposes a duty. . . ." *Morrisette v. United States*, 342 U.S. 246, 255 (1952). The dividing line may well be the degree of severity of punishment: "The defendant asks us to test the meaning of this statute by standards applicable to statutes governing infamous crimes. The analogy, however, is deceptive. The element of conscious wrongdoing, the guilty mind accompanying the guilty act, is associated with the concept of crimes that are punished as infamous. . . ." *Cardozo, J., in Tenement House Dept. v. McDevitt*, 215 N.Y. 160, 168, 109 N.E. 88, 90 (1915); see also MODEL PENAL CODE § 2.07(2).

75. Some degree of participation by higher levels of management may also be required, for a corporation to be liable for a crime. See MODEL PENAL CODE § 2.07 (1962); Note, Antitrust Enforcement against Organized Crime, 70 COL. L. REV. 307, 319 et seq. (1970).

There are additional problems peculiar to corporate defendants. Increasingly, corporations have been entering into agreements with their officers and directors to indemnify the latter against certain types of claims brought against them. While the corporation cannot sit in prison in place of a vice president who deliberately or carelessly helped to poison a river, might it, consistently with public policy, agree to indemnify him for any fine he has to pay? Even if such a practice were not upheld, it would be virtually impossible to prevent the corporation from indirectly reimbursing its officer for fines he had paid or even for the discomfort of a time in jail, by raising his salary or awarding other fringe benefits after a decent interval had elapsed.

Stockholders may be able to assert a derivative cause of action against officers or directors whose illegal conduct caused the corporation to be fined or otherwise suffer loss. Here, too, questions arise as to the validity of an indemnification agreement in this circumstance, as well as to the possibility of a corporation paying the premiums for insurance against such a liability. See Dykstra, The Revival of the Derivative Suit, 116 U. PA. L. REV. 74 (1967).

76. See Antitrust Enforcement against Organized Crime, supra note 75, at 319-20.

The privilege against self-incrimination could not,

course, be used by a corporation, nor could an employee refuse to testify on the ground that he might incriminate the corporation or another employee. Corporate records could not be withheld on Fifth Amendment grounds. Nevertheless, the possibility that a witness might incriminate himself would in many situations permit him to keep silent.

77. Cf. Gribetz and Grad, Housing Code Enforcement, supra note 74, at 1279. The authors point out that inadequate sentencing practices in housing cases arise out of the unwillingness of criminal courts to recognize housing violations as true "crimes," and that the same odium does not attach to the offense *malum prohibitum* as to the offense *malum in se*. The difficulty is not confined to prosecutions for housing violations, but extends to virtually all municipal prosecutions for health and safety offenses. There are grounds for apprehension that the same attitudes may prevail in prosecutions for environmental offenses.

78. It is significant that when a fine of \$10,000 was recently levied against a New Jersey firm, the United States Attorney described it as the largest ever imposed for water pollution in the United States. *N.Y. Times*, July 18, 1970, at 27, col. 1.

79. Small fines may, of course, be effective to deter the small-scale private polluter, such as the casual litterer, the careless motorist or power-boat operator, etc.

80. See LANE, THE REGULATION OF BUSINESSMEN, 21 et seq. (1954); Sutherland, Is "White Collar Crime" Crime?, 10 AM. SOC. REV. 132, 136 (1945); Flynn, Criminal Sanctions under State and Federal Antitrust Laws, 45 TEX. L. REV. 1301, 1304, 1305 (1967); Note, 70 COL. L. REV. 307, 319 et seq. (1970).

This is not to say that the ripples which spread out from the prison terms given to some electrical industry officials a few years ago did not have some deterrent effect upon corporate officers and employees generally. Perhaps a study might profitably be made of the impact of these sentences. There was not apparently, however, a sufficient impression of general success to give rise either to an intensified campaign on the part of federal enforcement officials to request

prison sentences or to a widespread tendency on the part of judges to impose them.

81. See Timberg, The Case for Civil Antitrust Enforcement, 14 OHIO ST. L. J. 315 (1953); Note, 71 YALE L. J. 280, 282 et seq. (1961), which presents the view that the criminal fine as presently administered is but "a reasonable license fee" for engaging in prohibited conduct. On a state level, see, e.g., MINN. STAT. ANN. § 115.07(6) (1964).

82. Criminal and civil proceedings are not necessarily mutually exclusive. See, e.g., Standard Sanitary Manufacturing Co. v. United States, 226 U.S. 20, 52 (1912). On a state level, see, e.g., CONN. GEN. STAT. ANN. § 19-516 (1969).

83. Cf., e.g., Federal Trade Commission Act, 38 Stat. 719 (1914), 15 U.S.C. § 45(b) (1) (1964); Clayton Act, 38 Stat. 734 (1914), 15 U.S.C. § 21(b) (1) (1964).

84. S.3546, 91st Cong., 2d Sess., § 10(b), (c). (1970).

85. See Gribetz and Grad, supra note 74, at 1281 et seq., especially 1283.

86. See Frankfurter & Corcoran, Petty Federal Offenses and the Constitutional Guaranty of Trial by Jury, 39 HARV. L. REV. 917 (1924); Gribetz and Grad, supra note 74, at 1284; United States ex rel. Marcus v. Hess, 317 U.S. 537 (1943); Helvering v. Mitchell, 303 U.S. 391 (1938); cf. Duncan v. Louisiana, 391 U.S. 145, 159 (1968).

87. See Note, Trial by Jury in Criminal Cases, 69 COL. L. REV. 419, 427-29 (1969).

It should be noted that a sanction, the severity of which is out of all proportion to the offense or the necessity, may be challenged on due process grounds. Cf. Life & Casualty Co. v. McCray, 291 U.S. 566, 571 (1934); Chicago & N. W. Ry. v. Nye Fowler Schneider Co. 260 U.S. 35, 44-45 (1922); St. Louis, I. M. & So. Ry. Co. v. Williams, 251 U.S. 63, 66-67 (1919); Missouri Pacific Ry. v. Tucker, 230 U.S. 340, 350-51 (1913); Chicago & Alton R. R. v. People ex rel. Koerner, 67 Ill. 1 (1873). Attack on the basis of the cruel and

unusual punishment clause of the Eighth Amendment is also possible. Cf. Douglas, J., concurring, in Robinson v. California, 370 U.S. 660, 676 (1962). There is no reason to believe, however, that penalties of the dimension suggested and in the circumstances referred to herein would run into constitutional difficulties of these kinds.

88. The mental state of the defendant could be pertinent in two respects: (a) if it is an element of the nuisance or other tort sought to be enjoined (this would not normally be so in environmental cases); (b) as an indication of whether the defendant is likely to continue or repeat the offense, thus necessitating injunctive relief. On a state level, see, e.g., MONT. REV. CODE ANN. § 69-3921 (Supp. 1969).

89. See, e.g., Boomer v. Atlantic Cement Co., 26 N.Y. 2d 219, 257 N.E. 2d 870, 309 N.Y.S. 2d 312 (1970), in which the New York Court of Appeals refused to enjoin operation of a plant which injured plaintiffs' property through its emissions of dirt, smoke and vibration, on the grounds that the technology permitting operation without pollution had not yet been developed and that the defendant's investment and its contribution to the economy of the community were large. Damages for permanent reduction in value of plaintiffs' property were awarded instead.

It should also be noted that the courts are unlikely to construe a statute requiring issuance of an injunction in case of actual or threatened violation as eliminating their discretion to refuse such relief if on balance they deem it undesirable. See Hecht Co. v. Bowles, 321 U.S. 321 (1944). See also Seadade Industries, Inc. v. Florida Power and Light Co., 232 So.2d 46 (D.C. App. Fla., Feb. 18, 1970). The court based its findings that the power company had not been guilty of gross abuse of discretion in discharging heated waters into Biscayne Bay on the fact that "a number of power generating plants are doing this at the present time," and refused to consider whether such discharge would adversely affect the area's environment and ecology.

90. E.g., Parker v. United States, 309 F. Supp. 593 (D.C. Colo. 1970). The court ordered a preliminary injunction to continue indefinitely, barring the

Secretary of Agriculture from selling lumber rights in a relatively untouched area.

91. For example, a state court fined a major polluter \$10,000 for failing to halt the discharge of industrial waste into the Buffalo River, but refused to enjoin its continued illegal operations because of the adverse effect its closing would have on business in the community. N.Y. Times, Oct. 6, 1970, at 44, col. 3.

Present federal laws also encourage denials of injunctions in the event of economic hardship. See, e.g., 33 U.S.C.A. § 1160(h) (1970); Barry The Evolution of the Enforcement Provisions of the Federal Water Pollution Control Act: A Study of the Difficulty in Developing Effective Legislation, 68 MICH. L. REV. 1103, 1106, 1120 (1970).

An advantage attending the injunctive process is the retention of jurisdiction by the court of equity. This enables the court to issue future orders in aid of its initial judgment, to modify its provisions, and to enforce compliance with or punish violations of the judgment. See, e.g., United States v. Florida Power and Light Co., 311 F. Supp. 1391 (S.D. Fla., 1970). The court did not find irreparable damage at the time the government requested that the utility be required to submit a plan to cool discharged water; but the court retained jurisdiction and implied such plan might be required later, stating "I am concerned about the large amount of heated water the units will discharge . . . in 1971 and 1972. Therefore, I do plan to receive evidence on this point at hearings to be scheduled at a later date" (311 F. Supp., at 1392).

While the usual maxims of equity are generally applied in injunction actions, where water quality is notoriously poor, a judge might be persuaded to waive the requirement that the plaintiff come into court with clean hands.

92. Penn Central is allegedly violating water quality standards by discharging oil from its Harmon, N.Y., yards into the Hudson River. Abatement hearings have been scheduled under § 10 of the Federal Water Pollution Control Act, 80 Stat. 1250 (1966), 33 U.S.C.A. § 1160 (1970). Current Developments, 1 ENVIRONMENT REP. 101 (1970).

93. Such a procedure was employed in *Schwarzenbach v. Oneonta Light & Power Co.*, 207 N.Y. 671, 100 N.E. 1134 (1911).

94. In *United States v. Bishop Processing Co.*, (423 F.2d 469 (4th Cir. 1970), cert. denied, 398 U.S. 904 (1970)) administrative proceedings dragged on from 1965 until 1968, when suit was finally initiated to abate interstate pollution pursuant to the Clean Air Act (81 Stat. 485 (1967), 42 U.S.C. § 1857 et seq. (Supp. V, 1965-69)). On July 28, 1968, the District Court denied defendant's motion to dismiss the government's suit, and an order to cease operations was affirmed by the Fourth Circuit on March 3, 1970. Certiorari was denied by the Supreme Court on May 18, 1970.

95. See *Grad*, supra, p. 107 et seq.

96. 56 Stat. 33 (1942) (repealed 1947).

97. E.g., *Testa v. Katt*, 71 R.I. 472, 47 A.2d 312 (1946), rev'd on other grounds, 330 U.S. 386 (1947); *Miller v. Municipal Court of Los Angeles*, 22 Cal.2d 818, 142 P.2d 297 (1943); *Stevenson v. Stoufer*, 237 Iowa 513, 21 N.W.2d 287 (1946) (characterizing such actions as "penal"); and *Overnight Motor Transport Co. v. Missel*, 316 U.S. 572, 583-84 (1942) (double damage action under Fair Labor Standards Act); *Lambros v. Brown*, 184 Md. 350, 41 A.2d 78 (1945); *Schaffer v. Leimberg*, 318 Mass. 396, 62 N.E.2d 193 (1945) (calling them "remedial").

98. *Bowles v. Willingham*, 321 U.S. 503, 512 (1944); *Porter v. Warner Holding Co.*, 328 U.S. 395, 398-99 (1946); cf. *Helvering v. Mitchell*, 303 U.S. 391 (1938); *United States ex rel. Marcus v. Hess*, 317 U.S. 537 (1943).

99. This is true even with respect to actions for damages brought by private plaintiffs. "The greatest single impediment in civil actions for damages has been proving that the defendant's pollution is the direct cause of the plaintiff's legal injury." Note, Private Remedies for Water Pollution, 70 COL. L. REV. 734, 745 (1970).

100. 56 Stat. 23 (repealed 1947).

101. Licensing Order No. 1, 8 Fed. Reg. 13240 (1943). This provision of the statute and its implementation were upheld in *Gordon v. Porter*, 155 F.2d 949 (9th Cir. 1946), cert. denied, 329 U.S. 763 (1946). It should be noted that this action was taken under the war power. Peacetime licensing would normally have to rest upon another source of Congressional authority, such as the commerce power, and might therefore not be applied so all-inclusively.

102. 56 Stat. 23, § 205(b) (repealed 1947) which provided for a fine of not more than \$5,000 or imprisonment for not more than one year, or both; § 205(e) provided for damages of the greater of \$50 or treble the excess amount charged; § 205(a) authorized injunctions against violations. On a state level, see, e.g., CAL. HEALTH & SAFETY CODE § 242631 (West 1967).

103. An eight-man investigating team, dispatched by the National Air Pollution Control Administration, in pursuance of its emergency inspection program, reported an American Cyanimide plant to be in violation of emission standards. Consequently, the plant has been forced to close pending replacement of its sulfuric acid producing units. Current Developments, 1 ENVIRONMENTAL REP. 55 (1970).

104. Licensing is being used by the Federal Power Commission in an experiment of possible substantial significance. The Commission has been attempting to condition licensing of the use of navigable rivers for power production with provisions that would invest it with continuing authority to appraise the public importance of the uses being made by the licensee, and, when desirable, to require the resource involved to be shifted to another use, such as comprehensive waterway development and conservation. These provisions were considered in *Rumford Falls Power Co. v. Federal Power Commission*, 355 F.2d 683 (1st Cir. 1966), and found to be within the Commission's authority to exact; the case was remanded for clarification so that the licensee might know what it might have to surrender or what compensation might be paid to it in the event of such diversion.

Previous attempts to retain control over private rights granted in natural resources have been largely ineffective. While the user may be regarded as a

trustee of the public interest, that interest has generally been left vague and undefined. In particular, courts have been reluctant to find a departure from the public interest where it would undermine the user's large investment. See Sax, Licenses--Restricting Private Rights in Public Resources, 7 NAT. RES. J. 339 (1967).

105. See United States v. United Mine Workers of America, 330 U.S. 258 (1947); United States v. Pewee Coal Co., 341 U.S. 114 (1951); but cf. Youngstown Sheet & Tube Co. v. Sawyer, 343 U.S. 579 (1952).

106. The extent of the government's liability for compensation in such circumstances is unclear. See United States v. Pewee Coal Co., 341 U.S. 114 (1951).

Another variation might be a procedure for an equitable receivership of the offending plant. The federal government would retain possession and conduct operations for as long as it was necessary to install corrective equipment or otherwise remove the cause of the violation and charge the expenses against the plant. Cf., e.g., the use of this technique as a remedy for housing violations. N.Y. MULT. DWELL. LAW § 309; Gribetz and Grad, supra note 74, at 1272-75.

107. E.g., 26 U.S.C. §§ 4745, 7301 et seq. (1964) (internal revenue violations); 49 U.S.C. § 781, 782 (1964) (transportation of contraband).

108. Illustrative cases applying these statutes include: United States v. Windle, 158 F.2d 196 (8th Cir. 1946) (automobile, used by owner to carry on wholesale liquor business without paying required tax, forfeited); United States v. One 1962 Ford 2-Door Sedan, 234 F. Supp. 798 (W.D. Va. 1964) (automobile used to transport customers to point of sale of illegal whiskey, forfeited); Ted's Motors v. United States, 217 F.2d 777 (8th Cir. 1954) (libel for forfeiture of automobile used for transporting narcotics); The Harpoon, 71 F. Supp. 1022 (D. Mass. 1947) (action to obtain forfeiture of boats carrying contraband firearms); and Dobbins's Distillery v. United States, 96 U.S. 395 (1877) (distillery subject to forfeiture where lessee conducts business with intent to defraud revenue).

109. E.g., United States v. Windle, 158 F.2d 196, 199

(8th Cir. 1946); *United States v. One 1950 Ford Half-Ton Pickup Auto. Truck*, 195 F.2d 857, 859 (6th Cir. 1952); *United States v. One 1951 Cadillac Coupe De Ville*, 125 F. Supp. 661, 663 (D. Mo. 1954).

110. 26 Stat. 210 (1890), 15 U.S.C. § 6 (1964).

111. *Antitrust Enforcement Against Organized Crime*, supra note 75, at 327-28.

112. *United States v. Addyston Pipe & Steel Co.*, 85 F.271 (6th Cir. 1898), modified, 175 U.S. 211 (1899)

113. Id. at 295-96.

114. 12 Wheat. 1, 14 (1827).

115. *Dobbins's Distillery v. United States*, 96 U.S. 395, 401 (1877). See also *Hartman v. Bean*, 99 U.S. 393, 397 (1878); *United States v. Stowell*, 133 U.S. 1, 14 (1899); *Goldsmith-Grant Co. v. United States*, 254 U.S. 505, 511 (1920); and, applying these principles to the states, *Van Oster v. Kansas*, 272 U.S. 465, 468 (1926).

116. This is the basis of the doctrine of deodand, which decreed that any chattel causing a person's death be forfeited to the crown. The Supreme Court narrates a short history of forfeiture in *Goldsmith-Grant Co. v. United States*, 254 U.S. 505, 510-11 (1920)

117. Cf. *Dobbins's Distillery v. United States*, 96 U.S. 395 (1877); *Goldsmith-Grant Co. v. United States*, 254 U.S. 505 (1920); *United States v. One Ford Coupé Automobile*, 272 U.S. 321 (1926).

118. See *Silesian-American Corp. v. Clark*, 332 U.S. 469 (1947). Domestic property has also been seized by the Federal Government in certain situations. See *United States v. United Mine Workers of America*, 330 U.S. 258 (1947).

There may be some circumstances in which seizure of something less than the entire offending property might be appropriate. For example, where the threat to environment is aesthetic rather than tangible, a scenic easement or other limited property right might be seized in order to avoid offenses to the eye.

119. In *One 1958 Plymouth Sedan v. Pennsylvania*, 380 U.S. 693, 697 (1965), the Supreme Court held that evidence obtained in violation of the Fourth Amendment cannot be the basis for sustaining a forfeiture. See also *Boyd v. United States*, 116 U.S. 616, 633-34 (1886): "We are also clearly of the opinion that proceedings instituted for the purpose of declaring the forfeiture of a man's property by reason of offenses committed by him, though they may be civil in form, are in their nature criminal. . . ."

120. Cf. *United States v. United States Coin and Currency Co.*, 393 F.2d 499 (7th Cir. 1968), cert. granted, 393 U.S. 949 (1968), reargument ordered, 395 U.S. 918 (1969). See also *Edwards, Forfeitures--Civil or Criminal?*, 32 TEMP. L. Q. 191 (1970); *Metallic Flowers, Inc. v. City of New York*, 4 A.D.2d 292, 164 N.Y.S.2d 227 (1957), modified, 5 N.Y.2d 246, 157 N.E.2d 170, 183 N.Y.S. 2d 801 (1958).

121. N.Y.C. AIR POLLUTION CODE, § 9.07 (1964).

122. See Rathjens, supra, p. 29 et seq.

123. In 1968, 83,698,100 automobiles were registered in the United States. NEW YORK TIMES ENCYCLOPEDIA ALMANAC 672 (1970).

124. Such as the periodic inspection of old vehicles, admittedly a difficult and expensive task.

125. There are other devices, apart from direct regulation, which may be useful in the packaging field, such as the use of deposits, bounties, user charges, etc.

126. This might be accomplished by direct regulation, or through one of the other techniques discussed above, such as licensing. See p. 241 supra.

127. As to the constitutionality of such regulatory techniques, see p.219 supra.

128. 42 U.S.C. §§ 1857b, 1857b-1, 1857c (Supp. V, 1965-69); 33 U.S.C.A. §§ 1153(c), 1155-58, 1164-70 (1970).

129. See W. ANDERSON, THE NATIONS AND THE STATES, RIVALS OR PARTNERS? 175-81 (1955); W. ANDERSON, INTER-GOVERNMENTAL RELATIONS IN REVIEW 43-45 (1960). On a

state level, see, e.g., MONT. REV. CODE ANN. § 69-3920 (Supp. 1969).

130. Clean Water Restoration Act of 1966, 80 Stat. 1248, 33 U.S.C.A. § 1158 (1970).

It should be noted that a grant for a municipal sewage treatment plant is in part a subsidy for industrial users of it, unless the municipality imposes appropriate charges upon such users. In some cases it may therefore be appropriate to condition the award upon the imposition of such charges.

131. See Report of the Joint Committee on Reduction of Nonessential Expenditures, Federal Grant-in-Aid to States and Payment to Individuals 605-10 (1957); U.S. Advisory Comm'n on Intergovernmental Relations, The Role of Equalization in Federal Grants; a Commission Report (1964).

132. Id. For a cogent criticism of subsidies to private enterprise, see ABT ASSOCIATES, INC., ECONOMIC ANALYSIS OF INDUSTRIAL INCENTIVES FOR POLLUTION CONTROL: IMPLICATIONS FOR WATER QUALITY 46-48 (1967) [hereinafter cited as "ABT"].

133. See note 128 supra.

134. See Hines, Controlling Industrial Water Pollution: Color the Problem Green, 9 B.C. IND. & COM. L. REV. 553, 598 (1968). The same might be said with respect to grants to slow-moving state and local governments.

135. See Rathjens, p. 33, supra.

136. A tire manufacturer has stated that it can use discarded tires in the making of new ones, but not on a break-even basis, and has suggested that a government subsidy or improvements in the process would be necessary if it were to be financially practicable. N.Y. Times, Sept. 27, 1970, § 3, at 1, col. 1. See also pp.258-67, infra.

137. Pp.230-1, supra.

138. For a discussion of state tax relief to induce pollution control, see McNulty, State Tax Incentives

to Fight Pollution, 56 A.B.A.J. 747 (1970).

139. Int. Rev. Code of 1954, §§ 38, 46-48.

140. Int. Rev. Code of 1954, § 169, as amended by § 704 of the Tax Reform Act of 1969, Pub. L. No. 91-172.

141. See generally, Surrey, Tax Incentives as a Device for Implementing Government Policy, 83 HARV. L. REV. 705, 713-15 (1970).

142. See Hines, supra note 134, at 599-601.

143. For a cogent criticism of tax incentives, see Surrey, supra note 141. For criticisms directed specifically at the use of tax incentives for pollution control, see ABT 41-46; Roberts, River Basin Authorities: A National Solution to Water Pollution, 83 HARV. L. REV. 1527, 1530-37 (1970).

144. But cf. Surrey, supra note 141, at 732-34. On a state level, see, e.g., MASS. ANN. LAWS, ch. 59, § 5(39) (Supp. 1969).

145. The Small Business Administration and the Economic Development Administration are presently making loans for this purpose. See ABT 24, 48-50. On a state level, see, e.g., CAL. HEALTH & SAFETY CODE § 24370.4 (West 1967).

146. 13 C.F.R. § 120.2 (1970).

147. 12 C.F.R. § 402.1 (1970).

148. E.g., Bureau of Indian Affairs, 25 C.F.R. § 91.19 (1970); Federal Housing Administration, 24 C.F.R. § 201.6 (1970); Veterans Administration, 38 C.F.R. § 36.4 et seq. (1970).

149. 42 U.S.C. §§ 1857b, 1857b-1 (Supp. V, 1965-69); 33 U.S.C.A. § 1155 (1970). On a state level, see, e.g., MONT. REV. CODE ANN. § 69-3909(9) (Supp. 1969).

150. NATIONAL ACADEMY OF SCIENCES, WASTE MANAGEMENT CONTROL 12-13, 185-90 (1966).

151. Id. at 14, 39-40.

152. Id. at 54-55, 82; see also Kneese, Pollution and a Better Environment, 10 ARIZ. L. REV. 14 (1968).

153. H. BOSSEL, SOLID WASTE: PROBLEMS AND SOLUTIONS 34 (1970); see generally R. LINTON, TERRACIDE (1970).

154. See NATIONAL ACADEMY OF SCIENCES, supra note 150, at 18-21; N.Y. Times, Oct. 8, 1970, at 1, col. 4 (recommendation of Council on Environmental Quality for national policy limiting dumping of waste into oceans).

155. Additional authority for federal expenditures for research in this area is contained in the Solid Waste Disposal Act of 1965, 79 Stat. 998 (1965), 42 U.S.C. § 3253 (Supp. V, 1965-69). Further steps have just been taken in the Resource Recovery Act of 1970, adopted Oct. 27, 1970 (CCH 1970 CONG. INDEX 1737).

156. See H. Bossel, supra note 131, at 16-17; Adams, Who Will Pay for Recycling Those "Disposables"?, 11 J. OF SOLID WASTES & SOIL, Jan.-Feb., 1970, at 12.

157. See 148 CHEMICAL & ENGINEERING NEWS, March 2, 1970, at 14; 148 CHEMICAL & ENGINEERING NEWS, April 6, 1970, at 38.

158. S. A. Hart, W. J. Flocker & G. K. York, Refuse Stabilization in the Land, 11 J. OF SOLID WASTES & SOIL, Jan.-Feb., 1970, at 14. See also H. Bossell, supra note 153, at 35-36.

159. H. Bossel, supra note 153, at 61-62.

160. Id. at 31-33.

161. See also COUNCIL ON ENVIRONMENTAL QUALITY, ENVIRONMENTAL QUALITY 114 (1st Ann. report 1970).

162. See, e.g., N.Y. Times, Mar. 15, 1970, § 4, at 10; N.Y. Times, July 8, 1970, at 24, col. 5 (project to recover saleable chemicals from power plant smoke); B. EASTLUNE & W. GOUGH, U.S. ATOMIC ENERGY COMM'N, THE FUSION TORCH: CLOSING THE CYCLE FROM USE TO REUSE.

163. Cf. note 136, supra.

164. See, e.g., Handler, Science Policy: Federal Support and Scientific Purpose, NATIONAL ACADEMY OF SCIENCES NEWS REP., Aug.-Sept., 1970, at 8.

165. See generally R. VAUGHN, BUREAU OF SOLID WASTE, SOLID WASTE MANAGEMENT: THE FEDERAL ROLE.

166. See especially A. KNEESE, THE ECONOMICS OF REGIONAL WATER QUALITY MANAGEMENT 82-98 (1964). See also, Rathjens, supra p. 29.

167. Id. at 160-67.

168. 116 CONG. REC. S6841 (daily ed., May 7, 1970) (remarks of Senator Proxmire); S.3665, 91st Cong., 2d Sess. (1970).

There remains, however, doubt whether there can be a way of disposing of solid wastes without hurting something. Burning them gives rise to one problem, grinding them up and depositing them in the water another. Carting them out into the ocean will help for a while, but as mentioned above this expedient will not last forever.

169. See Hearings on S. 2987 Before the Subcomm. on Air and Water Pollution of the Senate Comm. on Public Works, 89th Cong., 1st Sess., pt. 3 (1966); S. 2987, 89th Cong., 2d Sess. § 104(b) (1966).

The Council on Law Related Studies is presently sponsoring research in the workings of the Ruhr Valley program.

170. See Kneese, supra note 166, at 82-98; see also Delogu, Effluent Charges: A Method of Enforcing Stream Standards, 19 MAINE L. REV. 29 (1967).

171. VT. STAT. ANN., tit. 10, § 910(A) et seq. (Supp. 1970).

172. Combinations of several of these methods may be most effective in dealing with certain problem areas. For example, required deposits together with payment of bounties might be useful in dealing with such different aspects of solid waste management as the throw-away beer or soda container and the junked automobile.

173. An early example was the protective tariff, to safeguard "infant industries."

174. See Roberts, River Basin Authorities: A Natural Solution to Water Pollution, 83 HARV. L. REV. 1527 (1970).

175. N.Y. TIMES ENCYCLOPEDIA ALMANAC 178 (U.S. Budget), 674 (Gross National Product) (1970).

176. Cf. Hammer v. Dagenhart, 247 U.S. 251 (1918); Schechter Poultry Corp. v. United States, 295 U.S. 495 (1935); Carter v. Carter Coal Co., 298 U.S. 238 (1936). United States v. Darby, 312 U.S. 100, upholding federal regulation of wages and hours, was decided in 1941.

177. 49 Stat. 2036 (1936), 41 U.S.C. §§ 35-45 (1964). The statute also prescribes maximum hours, forbids child or convict labor, and requires safe and sanitary working conditions, in the performance of government contracts. Pursuant to the last of these provisions, regulations have recently been issued limiting noise levels in plants of government contractors. 34 Fed. Reg. 7948 (1969); see Grad, p. 72 supra.

178. 56 Stat. 351 (1942); 72 Stat. 384 (1958), as amended, 15 U.S.C. § 631 (1964); 70A Stat. 127 (1956), 10 U.S.C. § 2301 (1964); 63 Stat. 393 (1949), as amended, 41 U.S.C. § 251(b) (1964).

179. 4 CCH GOVT. CONT. REP. ¶ 33,638.70 (1970); id. at ¶ 33,722.45; id. at ¶ 33,755.22; id. at ¶ 33,760.20; id. at ¶ 33,771.60, ¶ 33.825. See also Standard Clause for Small Business Concerns, 7-104.14 set out in id. at ¶ 33,638.70 (1970). See generally for policy id. at ¶ 1020 (1970).

180. 70A Stat. 127 (1956), 10 U.S.C. § 2301 (1964); 32 C.F.R. §§ 1.700 et seq. (1970).

181. Act of June 11, 1942, ch. 404, §§ 1-12, 56 Stat. 351 (1942).

182. Defense Production Act of 1950, 64 Stat. 798 (1950), 50 U.S.C. App. § 2061 (1964).

183. Small Business Act, 72 Stat. 384 (1958), as amended, 15 U.S.C. § 631 et seq. (1964).

184. Exec. Order No. 8802, 6 Fed. Reg. 3109 (1941); Exec. Order No. 9346, 8 Fed. Reg. 7183 (1943). See also M. SOVERN, LEGAL RESTRAINTS ON RACIAL DISCRIMINATION IN EMPLOYMENT 9-17 (1966).

185. Exec. Order No. 10308, 16 Fed. Reg. 12303 (1951); Exec. Order No. 10479, 18 Fed. Reg. 4899 (1953); Exec. Order No. 10557, 19 Fed. Reg. 5655 (1954). Exec. Order No. 10925, 26 Fed. Reg. 1977 (1961); Exec. Order No. 11246, 30 Fed. Reg. 12319 (1965); Exec. Order No. 11375, 32 Fed. Reg. 14303 (1967). See also Sovrn, supra note 184, at 103-142, app. G.

186. 4 CCH GOVT CONT. REP. ¶ 33,638.70 (1970); id. at ¶ 33,695.25; id. at ¶ 33,722.45; id. at ¶ 33,755.22; id. at ¶ 33,760.20; id. at ¶ 33,771.60; id. at ¶ 33,825; id. at ¶ 33,831.60. See also Standard Clause for Equal Opportunity, 7-103.18 set out in id. at ¶ 33,636.90 (1970). See generally for policy 2 CCH GOV'T CONT. REP. ¶ 15,771 (1970). The appropriate "boiler plate" language, embodying these requirements, must be included in government contracts and subcontracts.

187. Civil Rights Act of 1964, 78 Stat. 253 (1964), 42 U.S.C. §§ 2000(e)-2000(e)-12 (1964).

188. Exec. Order No. 11246, 30 Fed. Reg. 12319 (1965), 42 U.S.C. § 2000(e) (Supp. III, 1967), as amended, Exec. Order No. 11375, 32 Fed. Reg. 14303 (1967). See also Note, 44 N.Y.U. INTRA. L. REV. 590 (1969), for a fuller discussion.

189. A charge of violation of the act must first be filed with the Equal Employment Opportunity Commission, which serves a copy on the respondent and investigates it. If it determines after investigation that there is reasonable cause to believe the charge is true, it is to endeavor to eliminate the practice by informal methods of conference, conciliation and persuasion. If it fails to achieve voluntary compliance, it so notifies the charging party, who may then bring an action in the Federal District Court, where the charges are considered de novo. Civil Rights Act of 1964, 78 Stat. 253 (1964), § 706, 42 U.S.C. § 2000e-5 (1964).

190. The small staff of the Equal Employment Opportunity Comm'n (E.E.O.C.) was swamped with thousands of cases and found itself unable to undertake informal methods of conciliation. It adopted the practice of notifying the charging party of its inability to effect compliance where such inability sprang from lack of capacity even to commence conciliation proceedings. It was held in Dent v. St. Louis-San Francisco Railway Co. (265 F. Supp. 56 (N.D. Ala. 1967)) and a few other cases that the institution of efforts at conciliation was a jurisdictional prerequisite to the institution of an action in court, thus leaving the aggrieved party remediless.

If the lower court decision in Dent was the Scylla facing the aggrieved Southern Negro employee, Miller v. International Paper Co. (290 F. Supp. 401 (S.D. Miss. 1967)), was the Charybdis. There it was held that the charging party had to institute his action in the District Court within sixty days of his filing of charges with the E.E.O.C., regardless of the latter's progress or lack of it in processing the charges; otherwise the case was forever barred.

191. Dent was reversed in 406 F.2d 399 (5th Cir. 1969) as was Miller, 408 F.2d 283 (5th Cir. 1969). See also Johnson v. Seaboard Coast Line R.R. 405 F.2d 645 (4th Cir. 1968) and Choate v. Caterpillar Tractor Co., 402 F.2d 357 (7th Cir. 1968).

192. 78 Stat. 253 (1964), 42 U.S.C. § 2000e(5)(g) (1964); see generally Walker, Title VII: Complaint and Enforcement Procedures and Relief and Remedies, 7 B.C. IND. & COMM. L. REV. 513-21 (1966).

193. Title VII, Civil Rights Act of 1964: Present Operation and Proposals for Improvement, 5 COL. J. OF LAW AND SOC. PROB. 1 (1969). See also EQUAL EMPLOYMENT OPPORTUNITY COMMISSION, 4th ANN. REP. 11 et seq. (1970), summarizing judicial decisions construing the scope of the statute. Almost all of the cases cited were actions brought by aggrieved individuals and most of them by the N.A.A.C.P. Legal Defense Fund.

194. 78 Stat. 253 (1964), 42 U.S.C. § 2000(e)(6) (1964).

195. Title VII, Civil Rights Act of 1964, supra note 193, at 39.

196. See, e.g., Johnson, Miller and Doherty, supra note 191. The problem of who speaks for the government, R.E.O.C. or the Attorney General's Office is discussed in Title VII, Civil Rights Act of 1964, supra note 193, at 39. See generally CCNY EMPL. PRAC. GUIDE § 16,900.001 (1968) and Berg, Title VII: A Three-Year's View, 44 NOTRE DAME LAWYER 311 (1969).

197. E.g., compare the 35 suits brought by the N.A.A.C.P. Legal Defense Fund alone through 1968 with the total of 10 by the Justice Department during the same period. Title VII, Civil Rights Act of 1964, supra note 193, at 39, 43. See also N.Y. Times, Oct. 13, 1970, at 44, col. 1.

198. Exec. Order No. 11246, 30 Fed. Reg. 12319 (1965), 42 U.S.C. § 2000(e) (Supp. III, 1967), as amended, Exec. Order No. 11375, 32 Fed. Reg. 14303 (1967).

199. Id., § 209(a) (6); 58 LAB. REL. REP. 127, 165 (1965). This has been done precisely once, and then only for a brief period. Govern, supra note 184, at 115.

200. The small business share of Department of Defense procurement actually dropped from 25.1% to 19.4% from 1954 to 1967. Its share of total government procurement has increased between 1960 and 1967 from 18.3% to 20.1%. S.B.A., SEMI-ANNUAL REPORTS (1956-61); S.B.A., ANNUAL REPORTS (1962-67).

201. See Hall v. Schultz, Civil No. 893-69 (D.D.C., filed Mar., 1969) (suit voluntarily dismissed following belated government compliance). See also N.Y. Times, Feb. 1, 1969, at 23, col. 1.

202. 41 C.F.R. § 60-1 at sec. (1970); see also for order of the Secretary of Labor, 30 Fed. Reg. 13441 (1965) and Exec. Order No. 11246, 30 Fed. Reg. 12319 (1965).

203. See H.R. 17222, 91st Cong., 2d Sess. (1970).

204. See clause 7-103.18 set out in 4 CCNY GOV'T CONF. REP. § 33,636.90 (1970) and 2 CCNY GOV'T CONF. REP. § 15,771 (1970).

205. Compare the careless disregard or conscious

subordination of environmental factors in a wide range of federal activities. Among some of the more obvious examples are the federal highway program, the Department of Agriculture's encouragement of almost indiscriminate use of pesticides and fertilizers, and the insistence on proceeding with the new supersonic transport plane. Attempts to bring this process under control can be found in the National Environmental Policy Act of 1969, § 102, Pub. L. No. 91-190, and Executive Order No. 11507, 35 Fed. Reg. 2573 (Feb. 4, 1970).

206. See Perkins v. Lukens Steel Co., 310 U.S. 113 (1940).

207. See p. 262 supra.

208. See pp. 253-8 supra.

209. This approach, however, is a questionable one and has not met with great success. Both the Federal Government and the County of Los Angeles have met severe opposition in attempting to procure anti-emission devices. Hearings Before the Subcomm. of the Senate Select Comm. on Small Business, 90th Cong., 2d Sess., at 341, 555 (1968).

210. The government's contracting power may be used in other ways as well. For example, federal leases to drill for offshore oil may contain clauses permitting revocation in the event of spillage.

211. Provisions encouraging such private litigation are contained in § 304 of S.3546, 91st Cong., 2d Sess. (1970) the proposed National Air Quality Standards Act of 1970, in the form in which it has recently passed the Senate. On a state level, see, e.g., MICH. COMP. LAWS ANN. § 691, 1202 (1970).

212. Another device for this purpose is the provision in Section 16 of the Rivers and Harbors Appropriation Act of 1899, 30 Stat. 1153, 33 U.S.C. § 411 (1964), which authorizes payment of half of the fines collected for wrongful pollution of navigable waters and other offenses to the person or persons who give information leading to conviction.

213. Actions of this kind might be authorized by the Hart-McGovern Bill, S. 3575, 91st Cong., 2d Sess. (1970).

214. See p. 217 supra.